SEPTEMBER 12, 1955

STEEL
The Metalworking Weekly

GERMAN REBIRTH

means close economic ties with other nations, says Minister Ludwig Erhard

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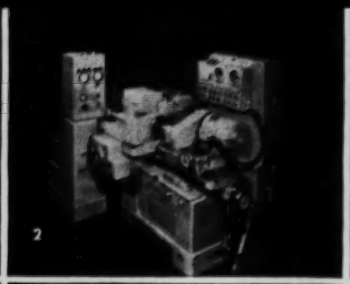
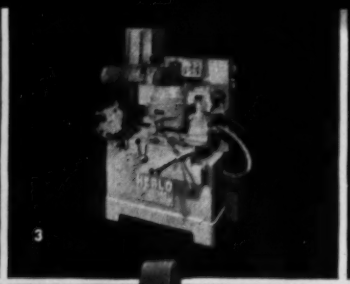
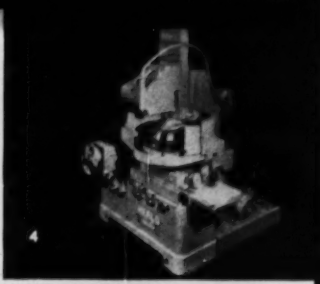

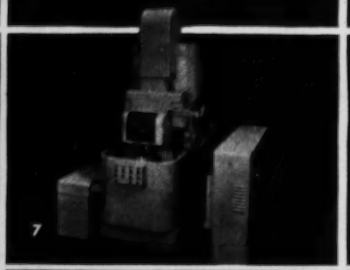

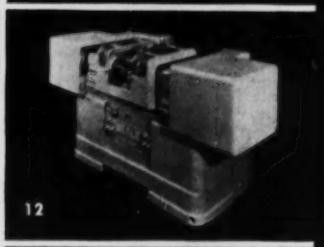
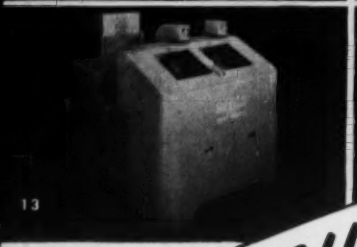

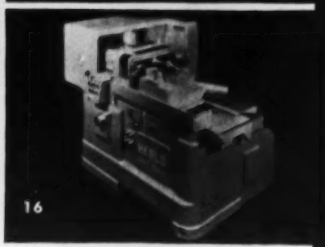

NOW SHOWING

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16 reasons why it PAYS to come to HEALD

1 **Model 190 Centri-Matic** Fully automated setup with rotary diamond, self-adjusting cycle and feedback.

2 **Model 1901 Centri-Matic** High production cycle with skip compensation and dressing, automatic after-gaging and feedback.

3 **Model 161 Rotary** Completely new, mechanically operated column-type unit for small work.

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7 **Vertical Bore-Matic** Completely new machine with vertical base for slide unit.

8 **Automated Borizing Unit** New, fully automated setup with automatic conveying, orienting, clamping, borizing, unclamping, flushing and after-gaging.

9 **Model 171 Size-Matic** Simultaneous bore and face grinding with slide-bar facing unit.

10 **Model 3 Tool Sharpener** New design with improved operation and longer life.

11 **Model 271 Gage-Matic** No. 2 size internal grinder with sliding-jaw collet chuck.

12 **Model 222 Bore-Matic** Double-end unit with multiple tooling for straddle facing, flycutting, spherical and taper boring.

13 **Model 242 Bore-Matic** Vertical spindle mechanical cam-slide unit.

14 **Model 2 Cam-operated Bore-Matic** Completely new machine set up for borizing all surfaces of work.

15 **Model 3 Cam-operated Bore-Matic** Completely new cam-type machine, set up to demonstrate Heald Feed-Out Quill.

16 **Model 321 Bore-Matic** Demonstrates versatility of interchangeable tooling and use of damped quills.

These new Heald developments represent the latest advances in precision finishing methods and equipment. They offer new opportunities for increased production, improved product quality and lower manufacturing cost per part.

All of these units are on display at the Heald exhibit — all in actual operation on production parts. Here you can see the tremendous progress that has been made in the productive efficiency of Heald borizing, internal grinding and rotary surface grinding equipment. You'll see why *now*, more than ever before, IT *PAYS* TO COME TO HEALD.

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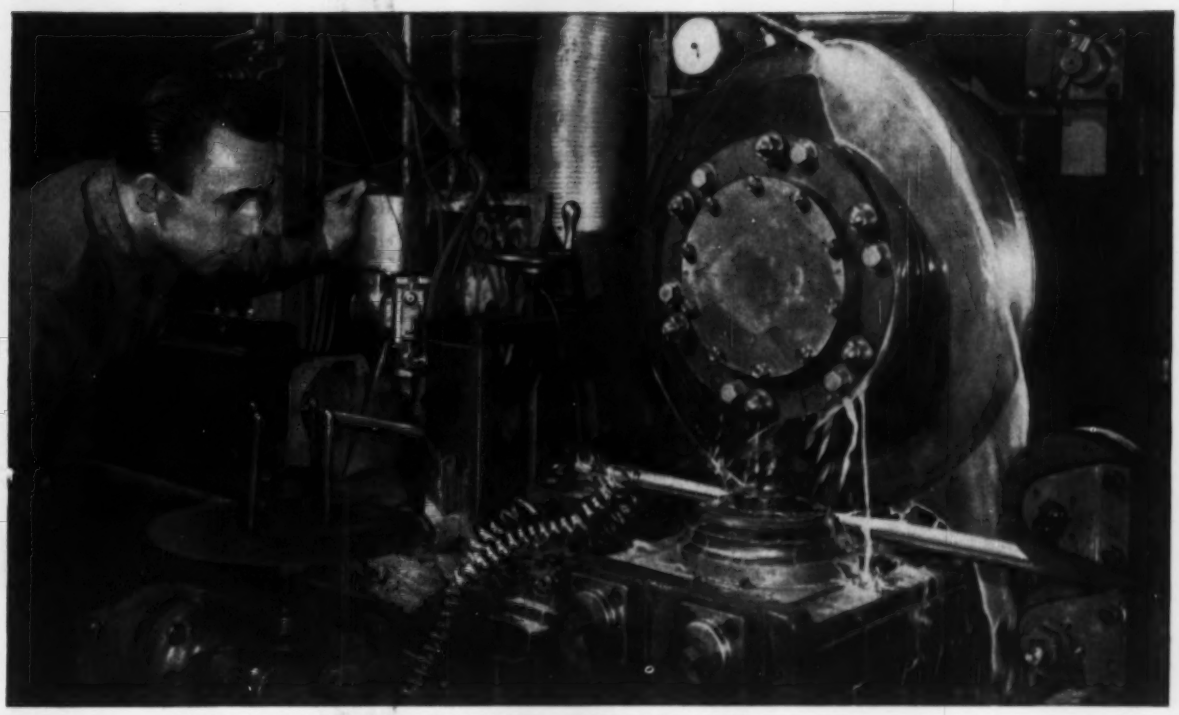

Excess weld metal spirals off formed tubing after seam is butt-welded. Nodulizing gun under operator's left hand then applies spelter coat over seam weld, following which tubing is cooled and sheared to desired length.

Tubing made from galvanized sheet

Bethcon galvanized sheet passes in continuous ribbon through forming mill at Welded Tube Company of America plant in Philadelphia.

This tubing is formed from galvanized coils, and it's such a hot item today because it is strong yet light and inexpensive. Typical uses: TV antenna masts, clothes poles, fence posts, playground equipment.

Tubing is one of several interesting new applications of galvanized steel made possible by the continuous galvanizing process. This method bonds the zinc much more tightly than conventional hot-dipping, and makes the finished steel available in long coils, rather than cut lengths only. It is one of the reasons why our galvanized steel volume has swelled tremendously in the last four years.

But the fabrication of galvanized steel sheets in these new uses is of course only one of dozens of lines of manufacturing whose consumption of Bethlehem sheets has increased enormously in the past few years. Put them all together, and add the continuing needs of long-time big users, and it's easy to see why Bethlehem is being called on to produce more hot-rolled and cold-rolled sheets than ever before.

We are doing just that. Our sheet mills at Lackawanna and Sparrows Point are turning out sheets at a record pace. Early this year we set a new all-time production high. The next month we topped even that. And we're continuing hard at it until production and consumption come into line.

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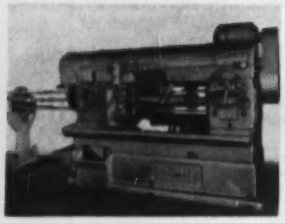
DATA FOR COMPARISON

Part.....Spec. Cap Screw	Length.....4 17/32" Cutoff 2" Thread
Machine.....1⅛" Conomatic	
Tools.....100% Carbide Tipped	RPM.....885 Work Spdl. 580 Th'd Spdl. 1465 Total Eff'd.
Material.....8742	
Stock Size.....1" Across Flats	Time.....14 Secs.



Conomatic

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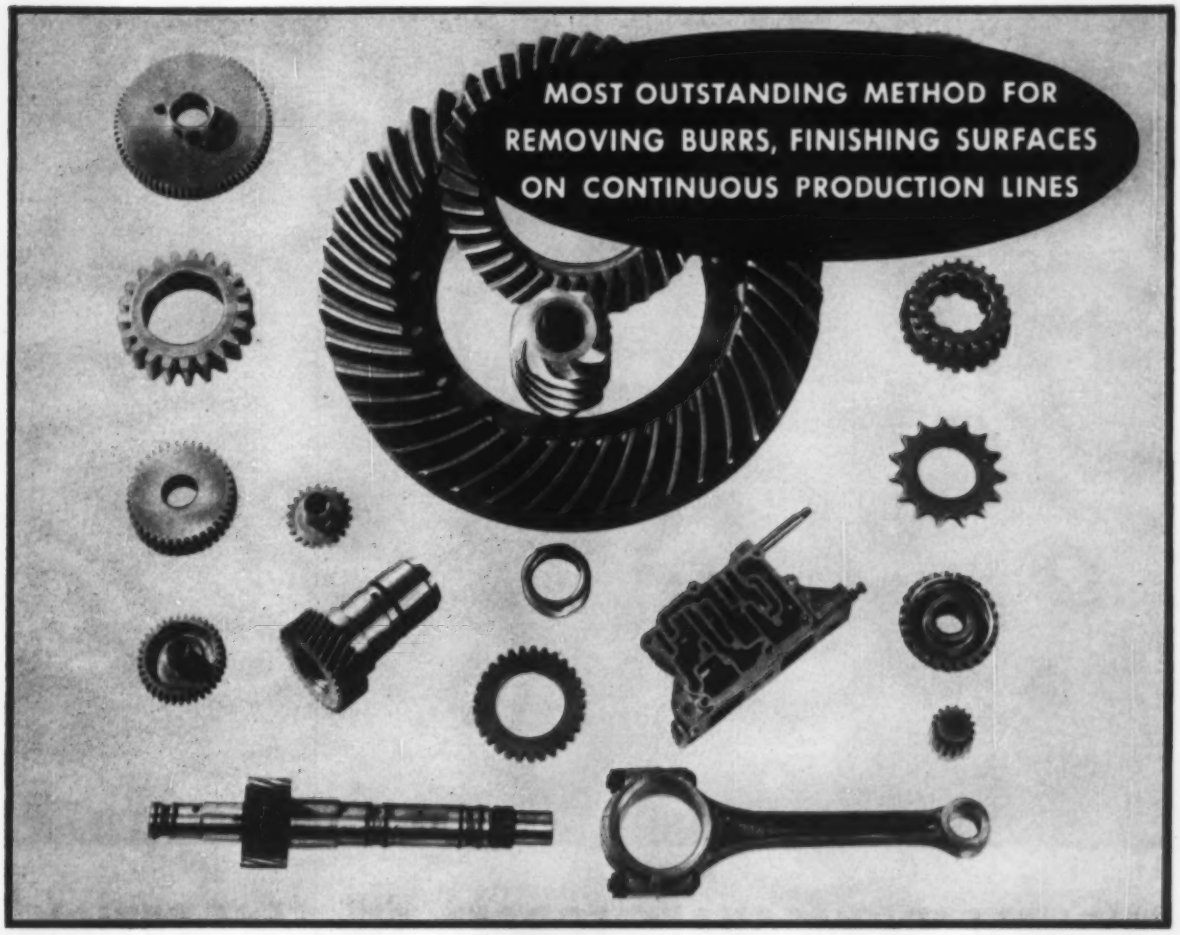
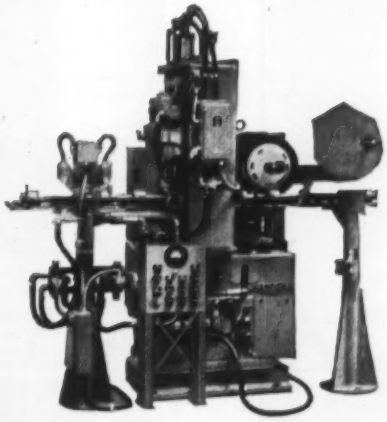
CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.



BRUSHAMATION BY OSBORN



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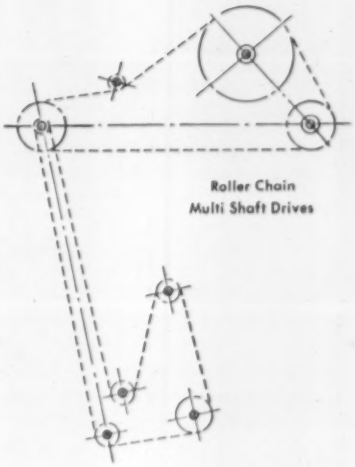

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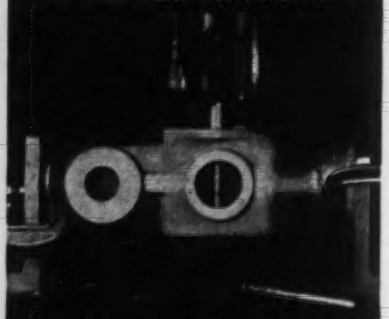

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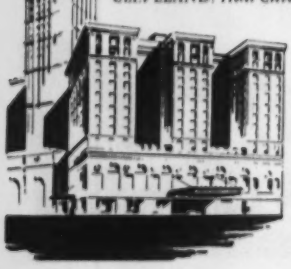

behind the scenes

Wonderful Titanium

Rutile is a reddish-brown mineral with a metallic luster. It is pronounced "roo-teel," with the accent on the first syllable, as in:

Said prospector Sandy McHootneil
"Uranium's here all aboot! We'll
Establish our mine
And set up a sign:
"This fine, bonny vein is just rutile."

Rutile's chief claim to fame is its ability to hold titanium. Indeed, it holds it so tenaciously metallurgists had a rough time trying to free the one mineral from the other—and if modern requirements hadn't demanded plenty of titanium, the world's supply probably would be locked up even yet in lumps of rutile and ilmenite. Ilmenite, however, comes in more than lumps; it appears in whole mountains, as in the Ilmen Range, a chain of the Ural mountains.

We submit this is a roundabout way to approach the subject of titanium, but sometimes a little background material can do wonders toward shedding light on a subject that bears investigation. Today, prospectors are scrambling all over the world for deposits of the reddish-brown mineral, because the titanium that can be shaken out of it is in great demand by aircraft manufacturers. One of the world's largest deposits is being developed by Republic Steel in southwest Mexico. (STEEL, Dec. 27, 1954, p. 27).

On page 98 will be found a technical article directing attention to a titanium alloy, Ti-6Al-4V, that can be heat treated. There is so much we don't know about so many things we always register surprise and enthusiasm when some new gem of information brightens our otherwise drab existence. Shrdlu didn't know titanium from geraniums. Now we're all excited about the wonders that can be cooked into or out of a metal that was so reluctant to leave its natural state it had no future except as a listing in a textbook.

Tech Section Clicks

STEEL's technical section always carries carefully edited articles on every angle of metalworking. In such an almost limitless field you'd wonder how the editors are able to restrain themselves when faced with mountains of material and space limitations. Reams of interesting stuff gets frozen out, so it follows that only the most important information appears in print. One such piece of information is the second part of an article (page 102) dealing with new concepts in abrasive belt polishing.

Did you ever work on a grinding and polishing line? The slapping, whining, squealing and quavering brings to mind the wares flung over tortured airways by disc jockeys. Modern delinquents of all ages apparently take great delight in these astonishing musical compositions. Many of the records sell in the millions. After you read the grinding and polishing story, make it a point to visit an automated surface treating line; make notes on the sounds you hear; throw in lyrics begging some obviously fed-up tomato to come back to whatever it was she left; and ten to one you'll have a hit record on your hands.

Punch Line

Our Scranton meat cutter told us that he got his idea for the solution of the match equation one evening when he and his wife were eating pie. "I just reversed the thought," he explained. "With us, it was a case of pie going into two; I made it a case of two going into pi." And with those words, he took the last match from VIII and placed it above the II, making a II. The equation then read: $\frac{\text{XXII}}{\text{VII}} = \text{II}$. We complained that it wasn't exact, but he said it was an approximation, and that nobody in Poland argued about it.

It's somewhat warm for puzzle working, so how about trying something different for vicarious relaxation. Just drop a card to ol' Shrdlu, and answer this question: If you were guaranteed complete immunity, whom would you like to punch right square in the snoot?

Shrdlu

(Metalworking Outlook—Page 51)

Let's Talk About Productive Maintenance

The ideal basis for any productive maintenance program is Remington Rand Kardex. Remington Rand Kardex combines in a single, accessible record complete information about each machine – characteristics, frequency of repairs, maintenance service and costs. Colored Kardlok signals let you review your entire program in a matter of moments, providing quick, effective, "locked-in" control.

In addition, Kardex is the ideal record for spare parts inventory control. An effective stores control system is indispensable to preventive maintenance. Without proper inventory control of replacement parts, valuable production will be lost and machine down time greatly increased.

Both these applications of Kardex are discussed in FREE booklet X1383, "Assured Equipment Productivity Through Maintenance Management." Write for *your* copy today. Address Room 1971, 315 Fourth Ave., New York 10, N. Y.

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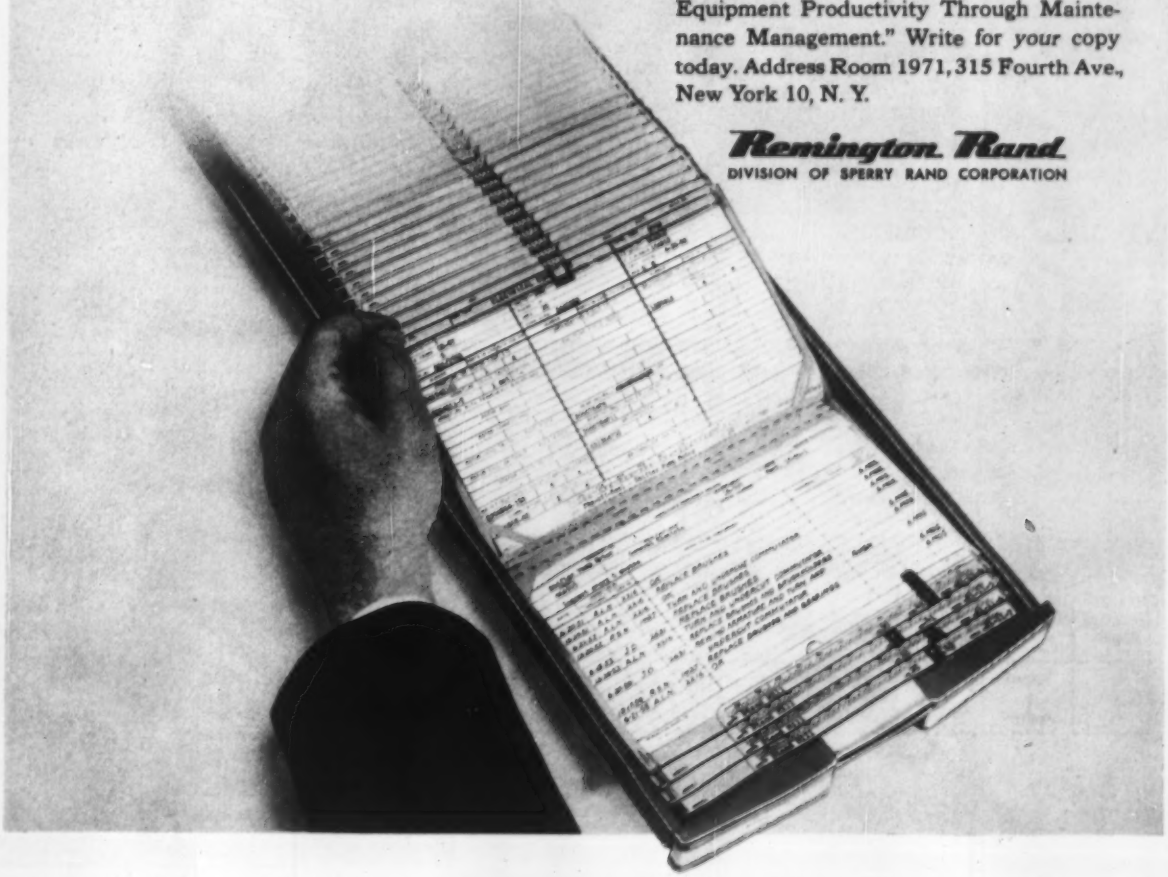

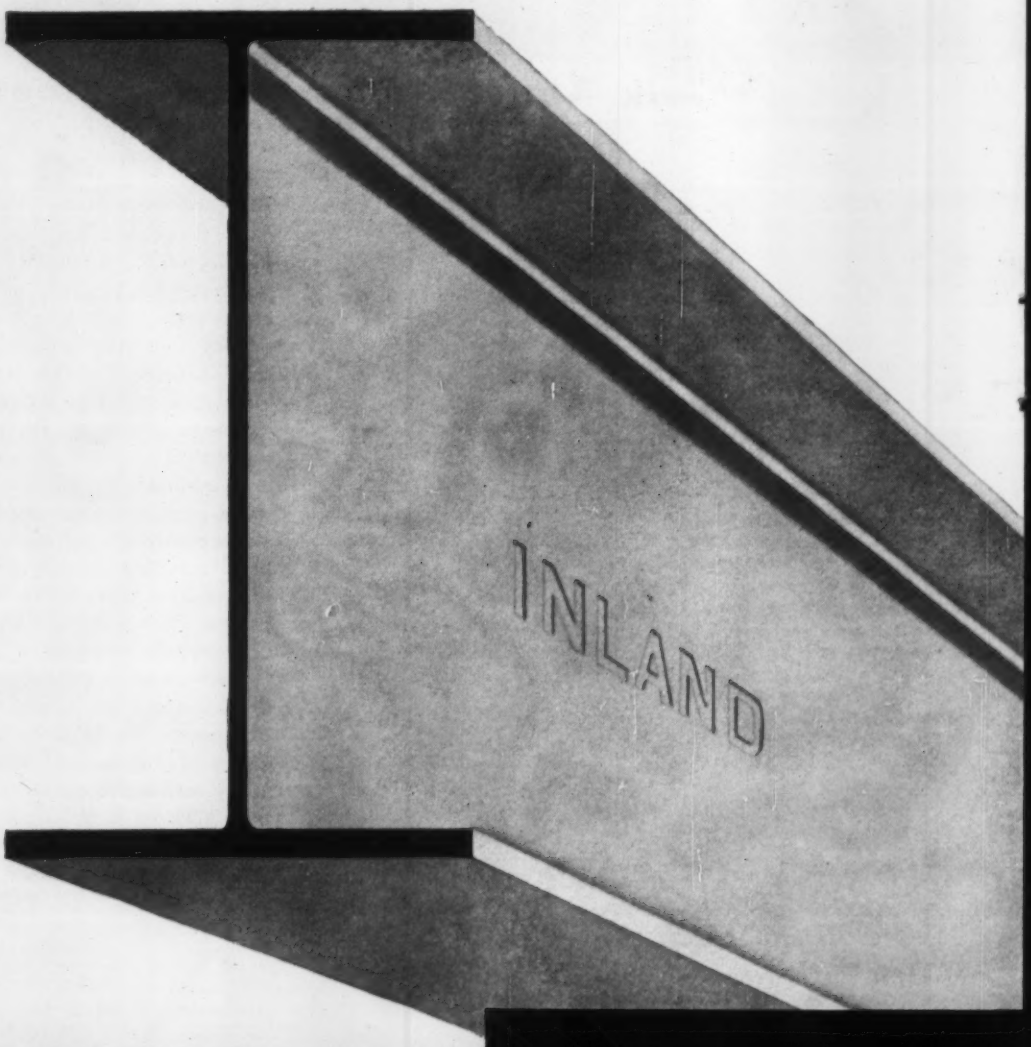

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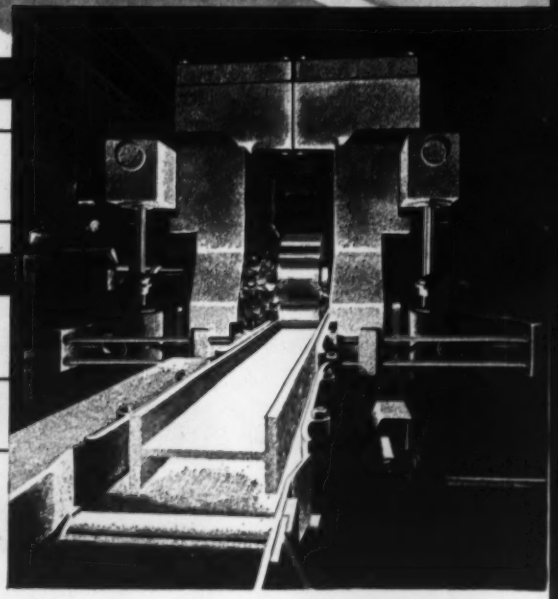

Inland's new WF universal type structural mill is designed specifically for rolling parallel flange type beams.

a dependable new source for WIDE FLANGE BEAMS

Rolling soon from Inland's new Wide Flange structural mill . . . a wide range of parallel flange beams to meet the expanding needs of the Mid-west construction industry.

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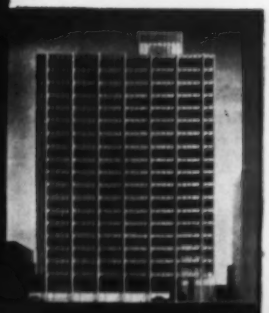
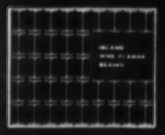
You'll find many welcome advantages in using Inland as your source for both Wide Flange and standard structurals. Our strategic central location, fully integrated manufacturing operation and long experience working with the construction industry, assures you of dependable service. Talk over your requirements with your Inland representative now.





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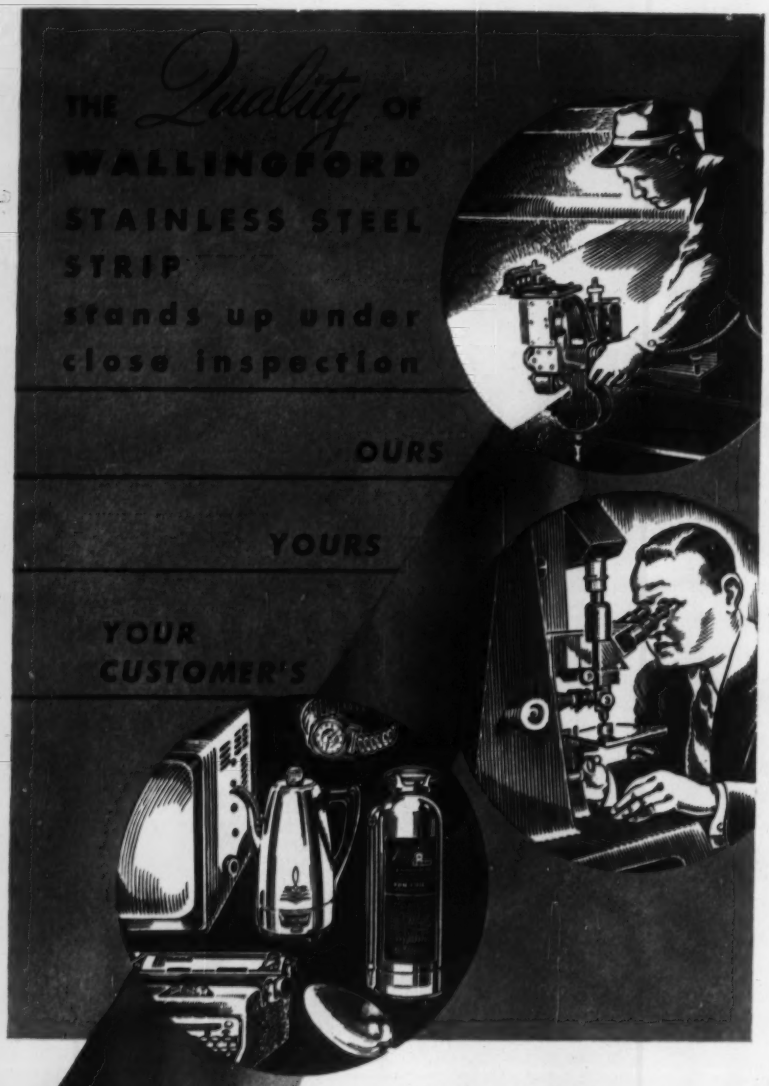

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LETTERS
TO THE EDITORS

Editorial Gives True Story

Congratulations on your editorial, "Know Your Costs" (July 25, page 39). This is one of the finest articles I have read. It hits the nail square on the head.

We have been plagued with this same ridiculous price competition. We know our costs, but it is hard to convince buyers that people are operating in the maner you describe. I should like 50 copies to give executives in firms here. I know my statements will carry more weight by backing them up with your article.

May I suggest you publish more articles of this nature in the future? I think leadership like yours can do a great deal to help this industry.

D. J. Fenelon
President
Guaranteed Welding Engineering Co.
Clifton, N. J.

Comment on Office Union

Your article, "Office Workers: Major Target for Unions" (Aug. 22, page 35) amused me.

Office workers are considered cheap help, and they haven't the guts to organize a union to help themselves. With married women working in offices (because they have husbands who cannot support them in the style they were accustomed to before they were married), the unions don't have a chance. These women are afraid to organize to protect their jobs.

I was in two office organization fights in which the union lost out. The union said, "we are behind you," but it was too far behind to do anything.

Organizers for office unions cannot get inside a plant and have to depend on the employee. They won't get far with cheap office help afraid of their jobs.

J. L. McCarthy
1121 Wildwood Ave.
Columbus, O.

Engineer Discusses Union

"Office Workers: Major Target for Unions" (Aug. 22, page 35) presented the engineer's union picture factually and concisely in an excellent piece of reporting.

ESA means it represents 40,000 engineering workers when it claims 40,000 members. The actual number represented is nearer 25,000, with about 70 per cent of that number dues-paying members. The discrepancy arises from listing charter units which did not join or were decertified.

That ESA is not tied to any major labor organization may also be a weakness, as shown by the recent strike at Minneapolis-Honeywell in Minne-

(Please turn to page 12)

to bring in a crop

You don't baby a work-horse like this Allis-Chalmers self-propelled All-Crop Harvester. Dawn-to-dusk harvesting is rugged work—and calls for ruggedness in every rotating part. Federal Ball Bearings insure trouble-free operation and years of good harvesting.

...or run off a copy

When big plans are afoot, Charles Bruning's king-size Copyflex is on the go all day. Engineering drawings and tracings are reproduced with high precision in a continuous conveying operation. Many feed rollers are used—Federal Ball Bearings keep 'em turning.

so much of industry *turns* on FEDERAL ball bearings

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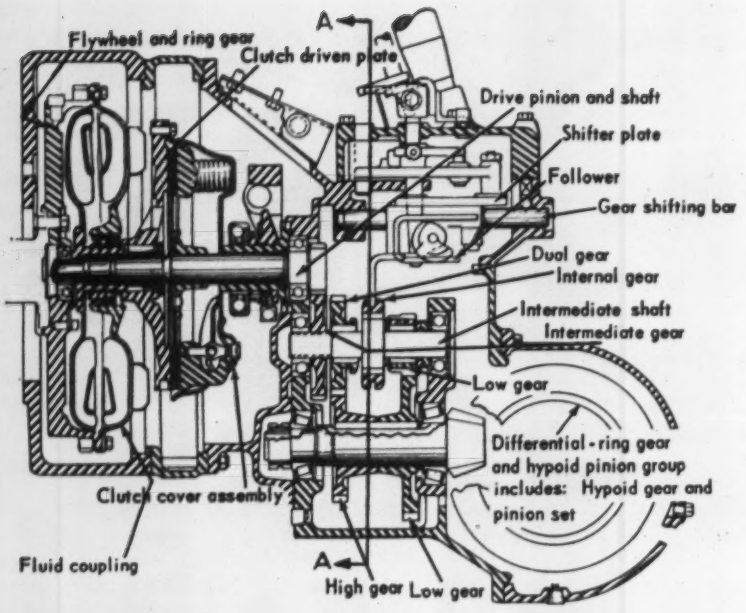
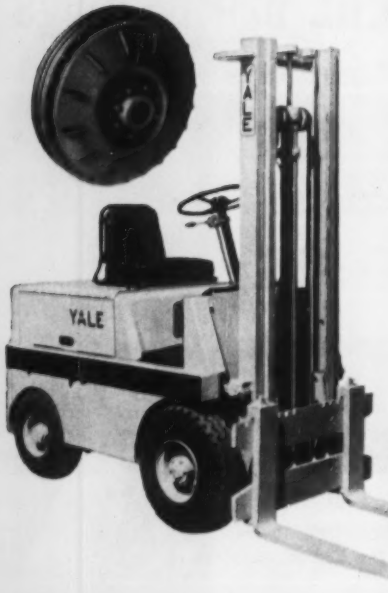


Flywheel redesign conserves space for fluid coupling...

Twin Disc's Fluid Coupling, *mounted compactly within the flywheel,* solved the space problem, reduced clutch maintenance and increased maneuverability of Yale's new G-52 Gasoline Fork Truck.

Materials handling trucks must make many rapid reversals of direction, numerous short runs at high acceleration, smooth starts and stops that won't cause load shifting . . . obviously a fluid coupling job. But, in an already tight arrangement, nesting the coupling *inside the flywheel* was the only solution without increasing truck length.

Next time *you're* planning or designing equipment that requires the power-smoothing, shock-absorbing advantages of Twin Disc Fluid Couplings... particularly where overall space and weight limitations present tough obstacles . . . contact Twin Disc Clutch Company, Hydraulic Division, Rockford, Illinois.



Twin Disc 12.25 Fluid Coupling smooths out operations on Yale's new G-52 line of Gasoline Fork Lift Trucks.

TWIN DISC

TWIN DISC

Fluid Couplings

LETTERS

(Concluded from page 10)

apolis. It lasted one week with settlement on company terms, largely because the AFL plant union did not honor the engineers' union picket line.

What engineers demand is simply real recognition of the engineering profession by management.

In a professional sense, the employee engineer is obligated to management as the consulting engineer is obligated to his clients; but the environment for the healthy growth of engineer-management relationships . . . requires good two-way communications as a base. Management has the means to control communication: It can stimulate or sabotage.

Management, let the engineer know where he stands, and know him as a human being (he often has a wife, children and a mortgaged home—circumstances quite common to the human race).

Engineers frequently are accused of being unable to sell management on engineering. I believe current engineering-management difficulties indicate the converse to be true. Engineer-management discord will not be eliminated until management recognizes that engineering demands skills and responsibilities as highly developed as the skills and responsibilities of the presently more renumerative specialties of sales and administration.

Donald W. Grundits
Professional Engineer
2147 Hoeschler Drive
La Crosse, Wis.

Guide for Future Needs

"Business Consultants: Their Uses and Limitations" (Aug. 15, page 123) is a fine, thought provoking article and certainly carries important information. Anyone reading it will understand the problems of consultants, and, incidentally, know how to get more worth-while information from consultants in the future.

Cliff Miller
Public Relations Director
Designers for Industry Inc.
Cleveland

Aluminum Strip Source

What is the source of the anodized and dyed aluminum strip mentioned in the Technical Outlook of Aug. 1 (page 71)?

A. P. Brietzke
Northern Engraving & Mfg. Co.
La Crosse, Wis.

• *It is Fromson Orban Co. Inc., 261 Madison Ave., New York 16, N. Y.*

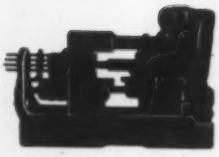
Valuable Information

Much valuable information is obtained from our copy of STEEL. It is circulated from one section head to another. We always look forward to receiving the next issue.

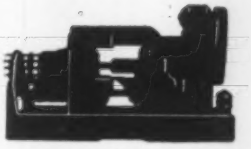
W. L. Kouba
Aircraft Engine Division
Ford Motor Co.
Chicago

with the addition of

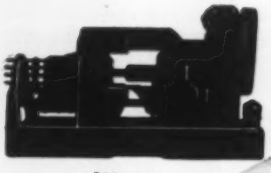
4 New Models



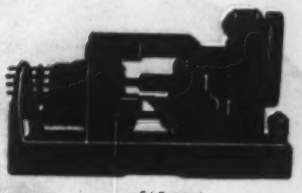
NEW 5/8" RA-8



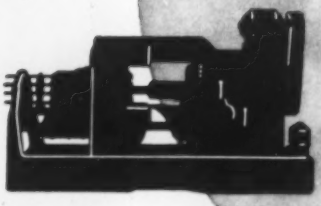
NEW 1¼" RB-8



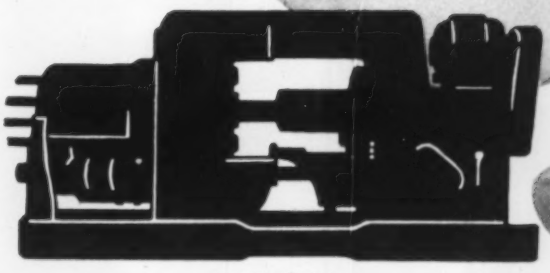
1⅝" RB-8



2⅝" RB-8



NEW 3½" RB-8



NEW 4" RB-8

Acme-Gridley 8-spindle advantages now extend to ALL ranges of bar work up to 4" diameters

The principal performance advantages of Acme-Gridley 8-spindle bar automatics now can profitably be applied to bar work as small as the capacity range of a 5/8" machine and as large as 4" diameter. These advantages include:

- faster machining cycle time because of additional end working positions;
- "new machine" reliability longer—with carbide or high speed tooling;
- greater accuracy and uniformity of parts with fewer rejects;
- completion of a greater number of secondary operations in the primary machine setup (spindle stopping mechanism optional), with consequent savings in man hours, floor space and machine investment.

And for help-when-you-need-it, these new models (and all Acme-Gridleys) are backed up by a wealth of "*complete line*" tooling experience (literally thousands of tooling setups) plus a policy for service which has always played a mighty prominent part in maintaining National Acme's position of leadership.

It will pay you to plan your production the modern Acme-Gridley 8-spindle way. Why not ask us to tell you more about it?

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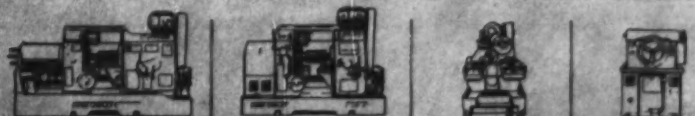

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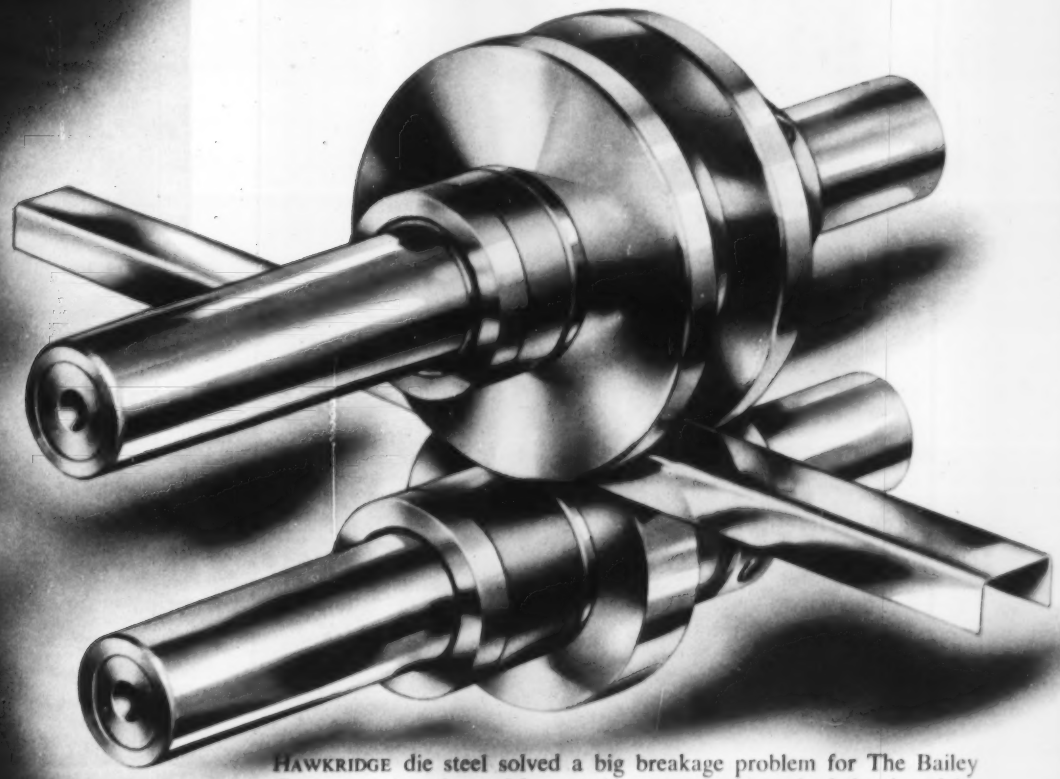

HAWKRIDGE die steel solved a big breakage problem for The Bailey Company, Amesbury, Mass. A heat treatment method developed by HAWKRIDGE insures long-lived dependability for the shafts that roll out most of the chrome strip that adds the touch of style to American automobiles.

This is another example of the way New England industries use metals from HAWKRIDGE'S fully-stocked warehouses. And there are good reasons why people like The Bailey Company depend on HAWKRIDGE as a source. Metals from HAWKRIDGE are *right* for the job. HAWKRIDGE'S complete stock insures that orders are filled according to specification. And strategic warehouse location insures *overnight delivery* to most points in New England.

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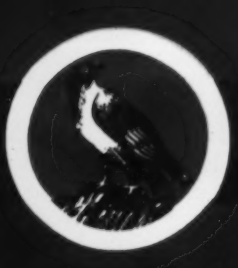

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Whether you're making chrome rolling shafts or 4-headed milling machines, you'll find that HAWKRIDGE is your best source for steels. For HAWKRIDGE carries the most complete line of steel for the metal-working industries in the New England area.

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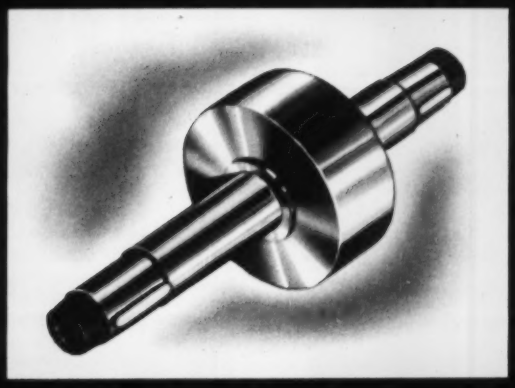
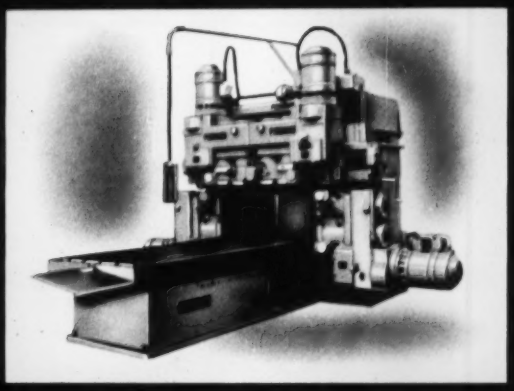
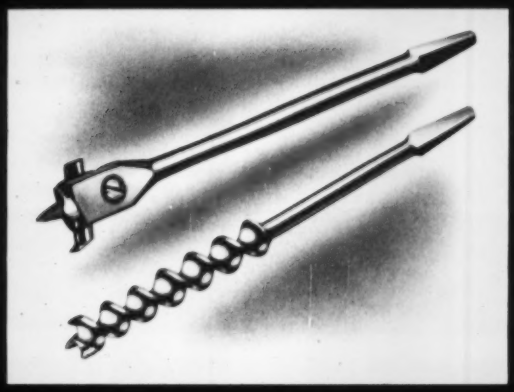


To insure continuous production of cold-rolled wire, Sleeper and Hartley, Inc., Worcester, Mass., uses Hawk Roll Steel to make these rolls. And frequently this customer uses Hawkridge Blue End AISI 1045 supplied by Hawkridge to make its arbors, too.

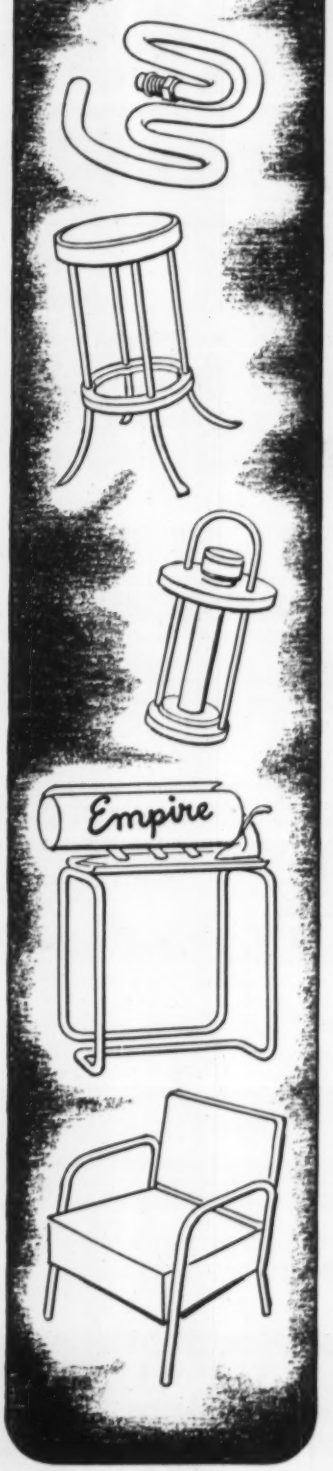


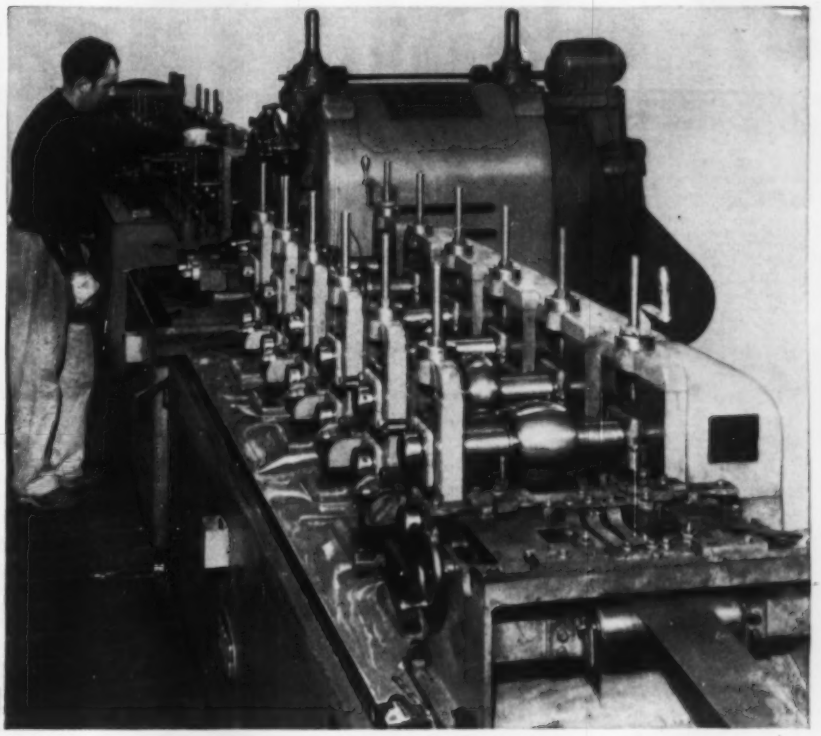
Drive for a four-headed milling machine — made for a major tractor manufacturing concern by Fitchburg Engineering Corporation, Fitchburg, Mass., is accomplished in large part by gearing, back shafts, spindle pinions and pick-off speed change gears made from Hawk Blue End 1045 H. R. steel.



Woodworkers' bits — made by Russell Jennings Division of The Stanley Works — are produced from steel supplied by Hawkridge. Expansive bit (above) and auger (below) are two of the home handyman's most useful small tools.

(Right) Yoder M-2½ Tube Mill installed by James Steel & Tube Co., Van Dyke, Mich. for making tubing sizes from ½" to 2½" o.d., incl.





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ELECTRIC-WELD TUBE MANUFACTURE

In tube making everybody wants the highest possible speed consistent with good, strong welds and dimensional accuracy. There are, in addition, at least three more essentials to profitable tube making, namely:

1. Low scrap losses—because cost per foot of strip metal is many times greater than the conversion cost.
2. Fine exterior finish, free from scratches, scuff marks and other irregularities which limit usefulness and lower salability.
3. Quick and easy mounting and adjustment of tooling, to reduce time losses between successive production runs.

Yoder tube mills excel in all these respects and have other mechanical, electrical and economic advantages. Because Yoder tube mill owners have found from experience their performance is as good as our promise, there are more Yoder mills sold and in operation than all other electric-weld mills combined. This is as true today as it was ten years ago.

If you want the plain facts about the things to look for in a tube mill, to insure most profitable operation over the years, the new Yoder Tube Mill Book will give them to you, in the simplest language and with numerous illustrations.

A copy is yours for the asking.

THE YODER COMPANY
5502 Walworth Avenue, Cleveland 2, Ohio

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FIFTY TON - - - - 3-50 SERIES

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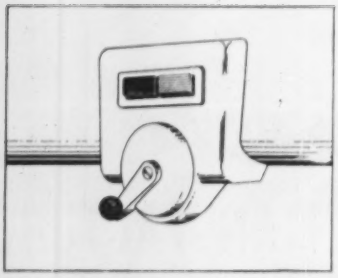
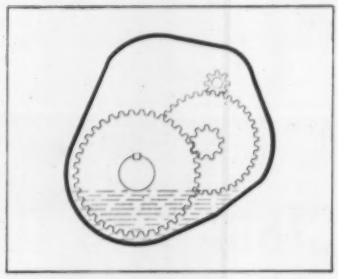
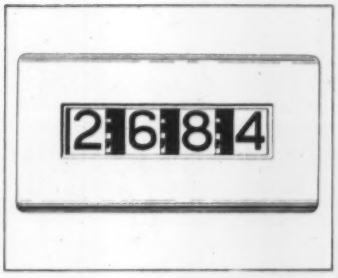


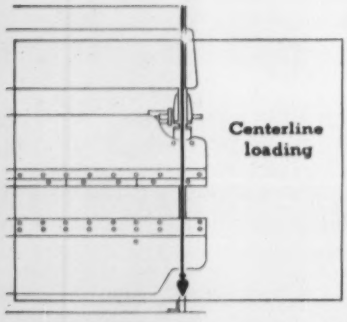
Front controlled, variable speed drive, 20 to 50 strokes per minute.



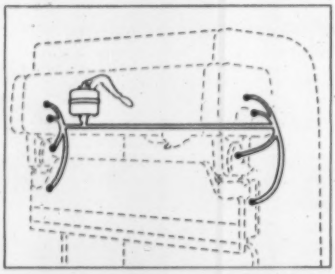
Completely enclosed transmission, running in oil.



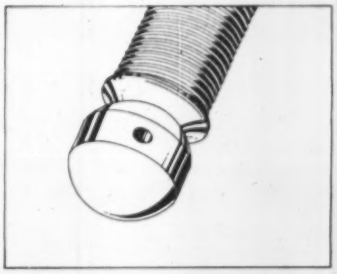
Two micrometer indicators, one at each end of the ram—easy to read and accurately record the amount of adjustment and tilt.



Centerline loading prevents weaving of the housings and insures accurate bends.



Centralized pressure lubrication system.



Ball end on the ram adjusting screws permits tapering of the ram for fade-out work.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

2-30 SERIES

This new 2-30 Series Cincinnati All Steel Press Brake has a capacity of 14 gauge x 6′ mild steel.

Look at these unusual standard features:

2½″ stroke—12″ shut height—9″ throat.

Distance between housings 5′-2″—overall die surface, 6′-0″.

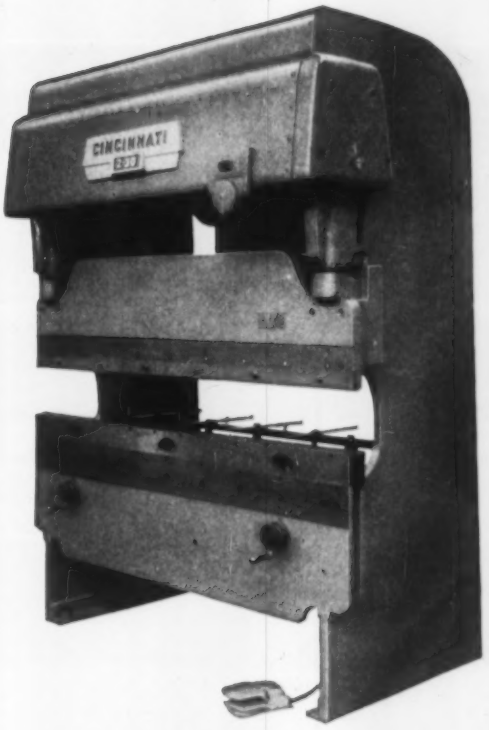
Front controlled, variable speed drive, 20 to 50 SPM. 4″ manual ram adjustment including ram tapering adjustment for fade-out work (power adjustment available as extra feature).

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



3-50 SERIES

These new 3-50 Series Cincinnati All Steel Press Brakes are built in two lengths and have a capacity of 10 gauge x 6′ mild steel. Investigate these unusual standard features: 3″ stroke—12″ shut height—12″ throat—distance between housings 6′-6″ or 10′-6″—overall die surface 8′-0″ or 12′-0″—front controlled, variable speed drive, 20 to 50 SPM.

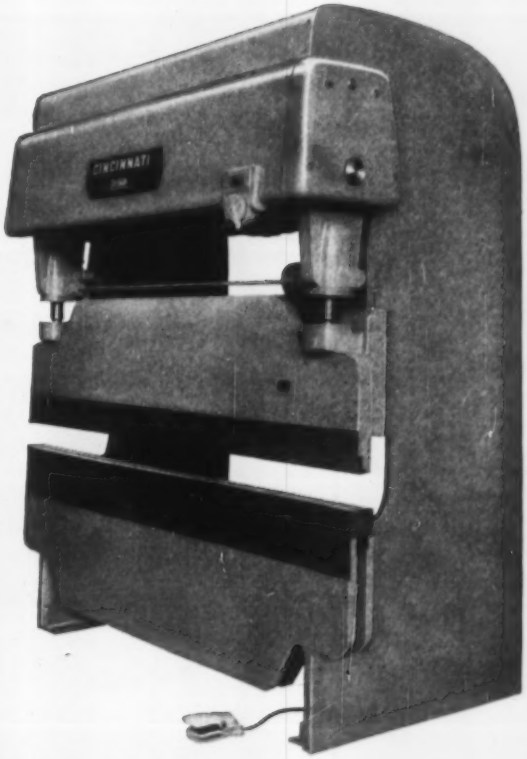
5″ motorized ram adjustment, including ram motor and control, complete with ram tapering adjustment for fade-out work.

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



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30 pieces (60 surfaces) per hour; ⅛" stock removed each side; limits ± .002"

ADJUSTING SCREW WASHERS

Low carbon steel; 200 pieces (200 surfaces) per hour; .025" stock removed; limits ± .001"

HOT ROLLED STEEL CAMS

225 pieces (450 surfaces) per hour; 1/32" stock removed each side; limits ± .001"

NOW! BLANCHARD PRESENTS ANOTHER GREAT NEW GRINDER

with Automatic Cycle Control

When you're at the show, watch this great new Blanchard Surface Grinder perform a variety of jobs with speed, ease and accuracy.

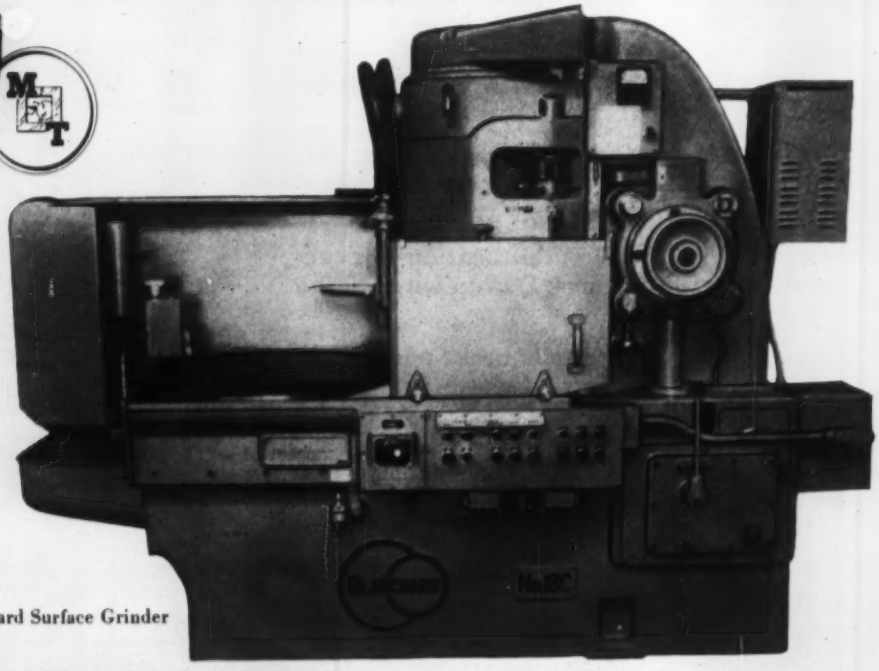
One operator can easily operate two of these No. 18-C grinders under balanced conditions. By using the automatic cycle, he can unload, clean and reload one grinder while the other is grinding.

Here's what the automatic cycle does: moves chuck (30" or 36" dia.) to grinding position and starts it rotating; starts wheel rotation and coolant pump; provides rapid wheel approach to work; engages power down-feed at preset rate; changes to fine feed just before finished size is reached; stops feed when work is to size – "sparks" out; raises wheel head; stops wheel, coolant pump and chuck; moves chuck to loading position – demagnetizes chuck.

This new Blanchard also features: push button selection of manual or cycle operation; size control; simplified feed and head traverse controls; adjustable dwell timer.

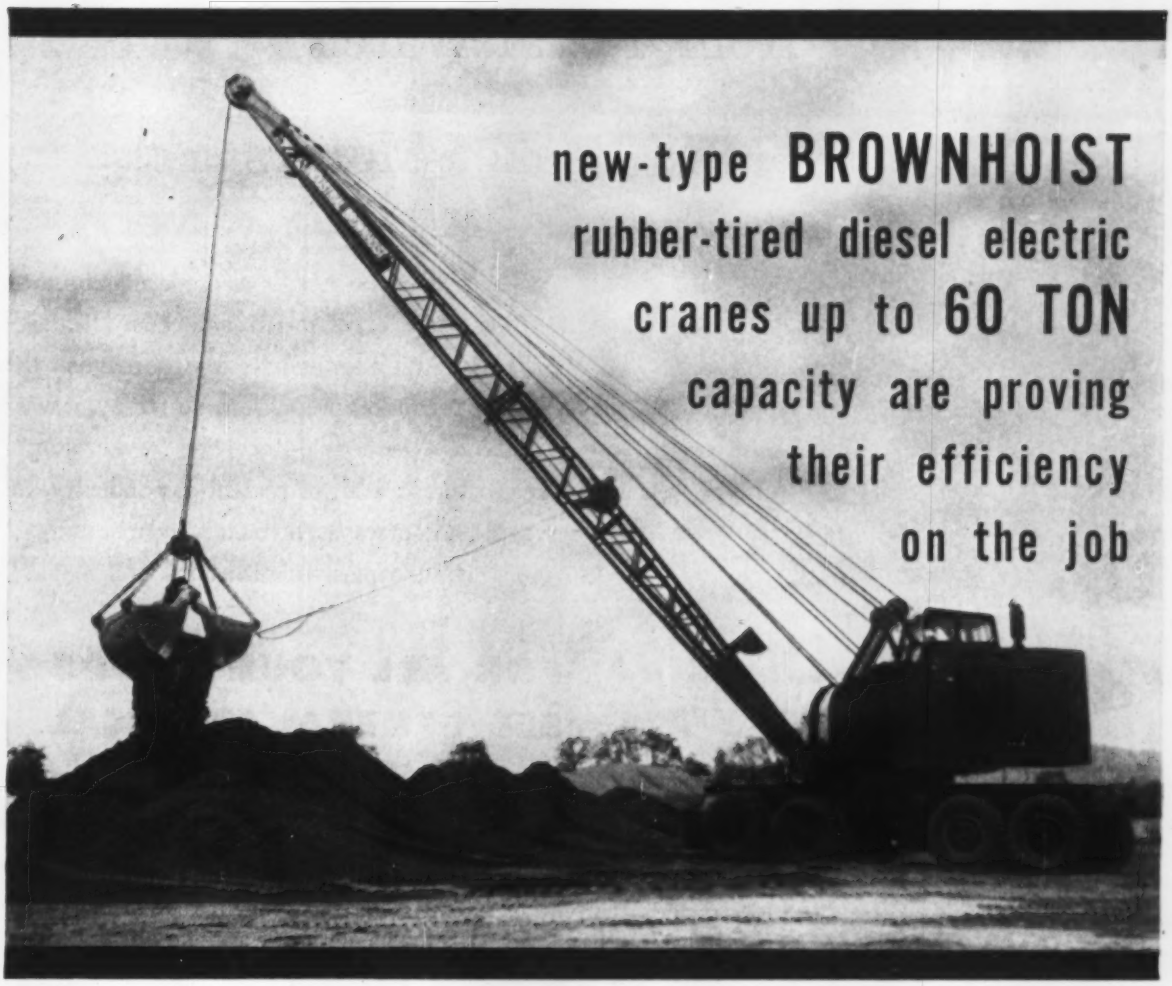
THE MACHINE TOOL SHOW CHICAGO, ILL.

BOOTH 406



No. 18-C Blanchard Surface Grinder

THE BLANCHARD MACHINE COMPANY 64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.



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For over 50 years, General Chemical has been one of the nation's leading producers of nitric acid in all its forms . . . for every type of application. It was first to develop the special fuming nitrics which have come into prominence in the rocket research program; currently General offers the widest selection of grades and strengths on the market. That's why we say—for all your nitric needs from a carboy to a carload—just phone or write any General Chemical office listed below.

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CALENDAR
OF MEETINGS

Sept. 6-17, Metalworking Machinery & Equipment Exposition: Coliseum, Chicago. Information: Exhibition & Convention Management Inc., 2689 E. Overlook Rd., Cleveland 6, O. General Manager: C. L. Wells.

Sept. 6-17, National Machine Tool Show: International Amphitheatre, Chicago. Sponsor: National Machine Tool Builders' Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 6-17, Production Engineering Show: Navy Pier, Chicago. Sponsor: National Machine Tool Builders' Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 11-14, National Metal Trades Association: Eastern plant management conference, Essex and Sussex hotels, Spring Lake, N. J. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: C. L. Blatchford.

Sept. 11-16, American Chemical Society: Fall meeting, University of Minnesota, Minneapolis. Society's address: 1155 16th St., N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 12-14, American Road Builders Association: Annual conference of county engineers and officials, New Riverside hotel, Gatlinburg, Tenn. Association's address: World Center Bldg., Washington 6, D. C. Secretary: Eugene Reybold.

Sept. 12-14, Allied Railway Supply Association: Annual meeting and exhibit, Sherman hotel, Chicago. Association's address: P.O. Box 5522, Chicago, Ill. Secretary: Charles F. Weil.

Sept. 12-15, Automotive Electric Association: Fall meeting, the Homestead, Hot Springs, Va. Association's address: 16223 Meyers Ave., Detroit 35, Mich. Secretary: S. W. Potter.

Sept. 12-15, Society of Automotive Engineers Inc.: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Sept. 12-16, Instrument Society of America: Annual conference and exhibit, Shrine Auditorium and Exposition Hall, Los Angeles. Society's address: 1319 Allegheny Ave., Pittsburgh 33, Pa. Executive director: William H. Kushnick.

Sept. 14, Steel Kitchen Cabinet Manufacturers Association: Fall meeting, Hotel Cleveland, Cleveland. Association's address: 1008 Engineers Bldg., Cleveland, O. Secretary: Arthur J. Tuscany Jr.

Sept. 14-15, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 14-16, Porcelain Enamel Institute: Shop practice forum, Deshler-Hilton hotel and Ohio State University, Columbus, O. Institute's address: 1145 19th St. N.W., Washington 6, D. C. Secretary: John C. Oliver.

Sept. 15-18, Packaging Machinery Manufacturers Institute: Annual meeting, the Homestead, Hot Springs, Va. Institute's address: 342 Madison Ave., New York 17, N. Y. Secretary: Helen L. Stratton.

Sept. 18-22, American Institute of Wholesale Plumbing & Heating Supply Associations Inc.: Annual meeting and exhibit, Waldorf Astoria hotel, New York. Institute's address: 402 Albee Bldg., Washington, D. C. Executive secretary: George T. Underwood.

Sept. 20, Cutting Tool Manufacturers Association: Fall meeting, Lochmoor club, Detroit. Association's address: 416 Penobscot Bldg., Detroit 26, Mich. Executive secretary: Martin J. Ewald.

Sept. 20-22, Society of Industrial Packaging & Materials Handling Engineers: Annual exhibit, Kingsbridge Armory, New York. Society's address: 111 W. Jackson Blvd., Chicago 4, Ill. Managing director: C. J. Carney Jr.

Sept. 21-23, National Association of Foremen: Annual meeting, Fort Worth hotel, Fort Worth, Tex. Association's address: 321 W. First St., Dayton 2, O. Secretary: Mrs. Jean B. Adams.

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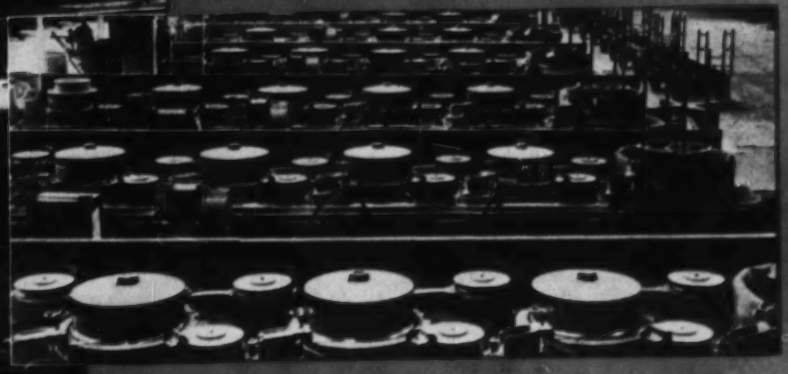
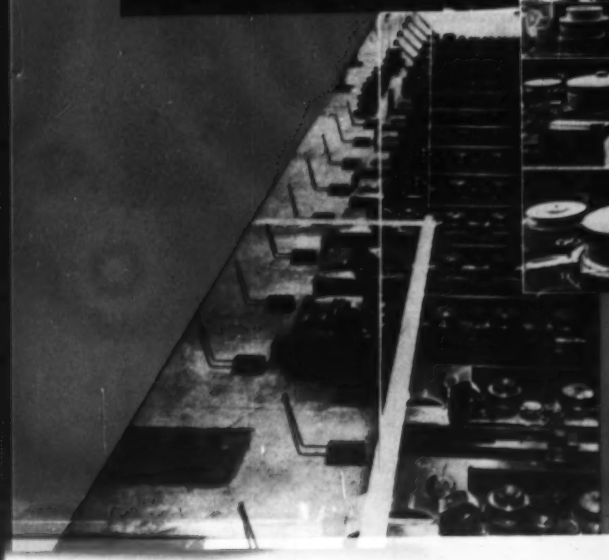
Let your high-volume needs in wire be matched by Vaughn Motoblox' high productivity! These famous machines meet quotas with quality—in speed and dependability. A Vaughn engineer will be happy to give you the facts, at your convenience.





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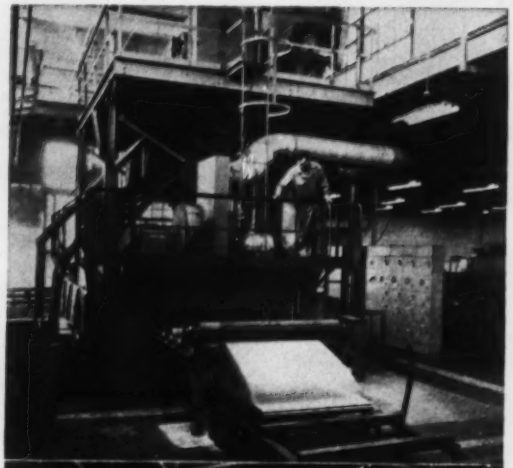

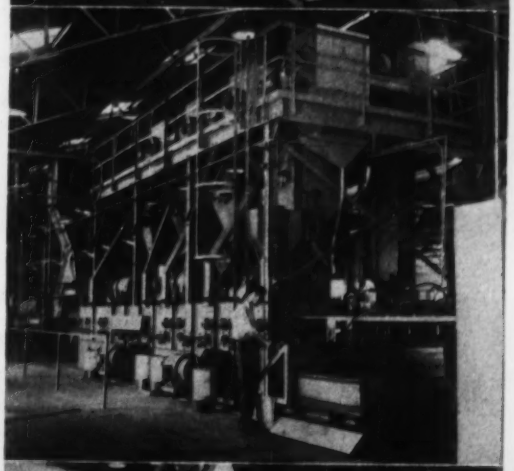

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Sheet steel, formerly purchased pickled and oiled at a premium from the mill, now is descaled in a Wheelabrator airless blast cleaning cabinet at the Permaglas-Heating Division. Savings effected by mechanical descaling were sufficient to amortize investment within one year's time.

• RHEEM MFG. CO.

Wheelabrator mechanical descaling reduced steel cleaning costs $3 to $4 per ton in seven "Rheemcote" lithographed steel drum manufacturing plants. The matte finish produced on the steel sheets also anchors the full-color lithographed finish in a permanent bond.

• ATWOOD VACUUM MACHINE CO.

Wheelabrator mechanical descaling of steel sheet and coil stock, used in its production of automotive hardware, etc., has improved operations many ways for Atwood. Cleaning costs are considerably less than pickling. The matte finish of the Wheelabrated steel provides an excellent base for lubricant used for cold drawing and forming, and the steel draws readily and welds easily.

• START THESE SAVINGS NOW

Wheelabrator mechanical descaling saves many dollars per ton compared to the purchase price of pickled stock. Start now to make worthwhile savings in your own operations. Write today for complete information.

World's largest builders of airless blast equipment

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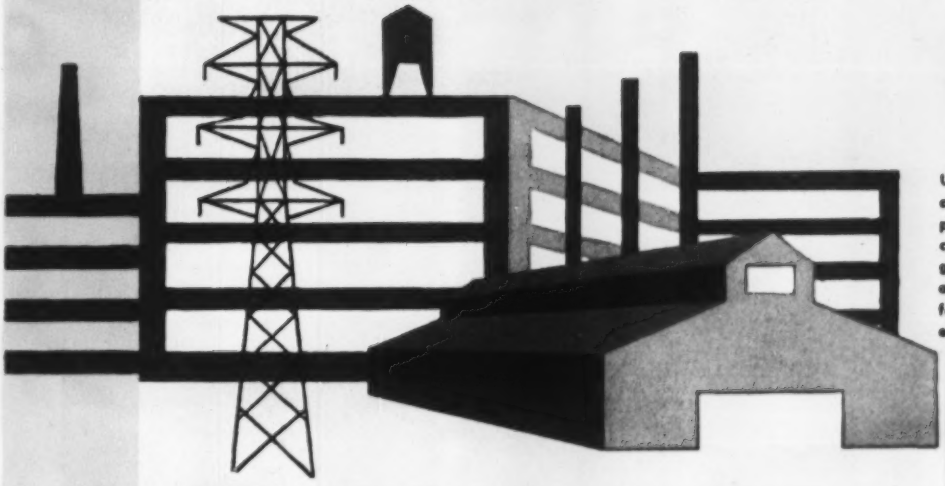
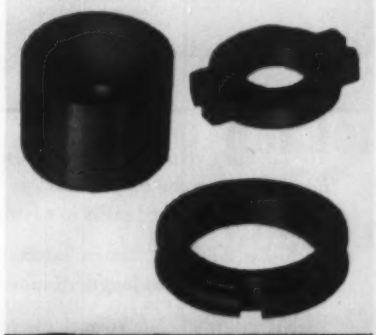
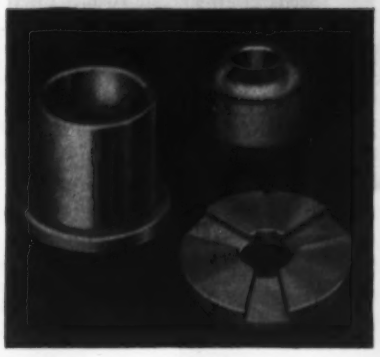


USO® Brushes are available in production or replacement lots in carbon, carbon-graphite, electrographitic, pure graphite and metalgraphite grades for all types of rotating electrical equipment.



GRAPHITAR® (carbon-graphite) is a versatile engineering material of carbon-graphite composition offered in many grades for bearings, seals, piston rings, pump vanes, thrust washers, valve seats, pistons, bushings.

Metallurgical graphite grades for carbon control in iron and steel melting, mold coatings, hot topping compounds, Cordip®, Mexaloy® for refractory mixtures and other MEXICAN® products.



GRAMIX®: Sintered-metal bearings, gears, cams, slides, rollers, bushings and machine parts available in ferrous and non-ferrous alloys. The metal with the built-in lubrication.

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THE UNITED STATES GRAPHITE COMPANY

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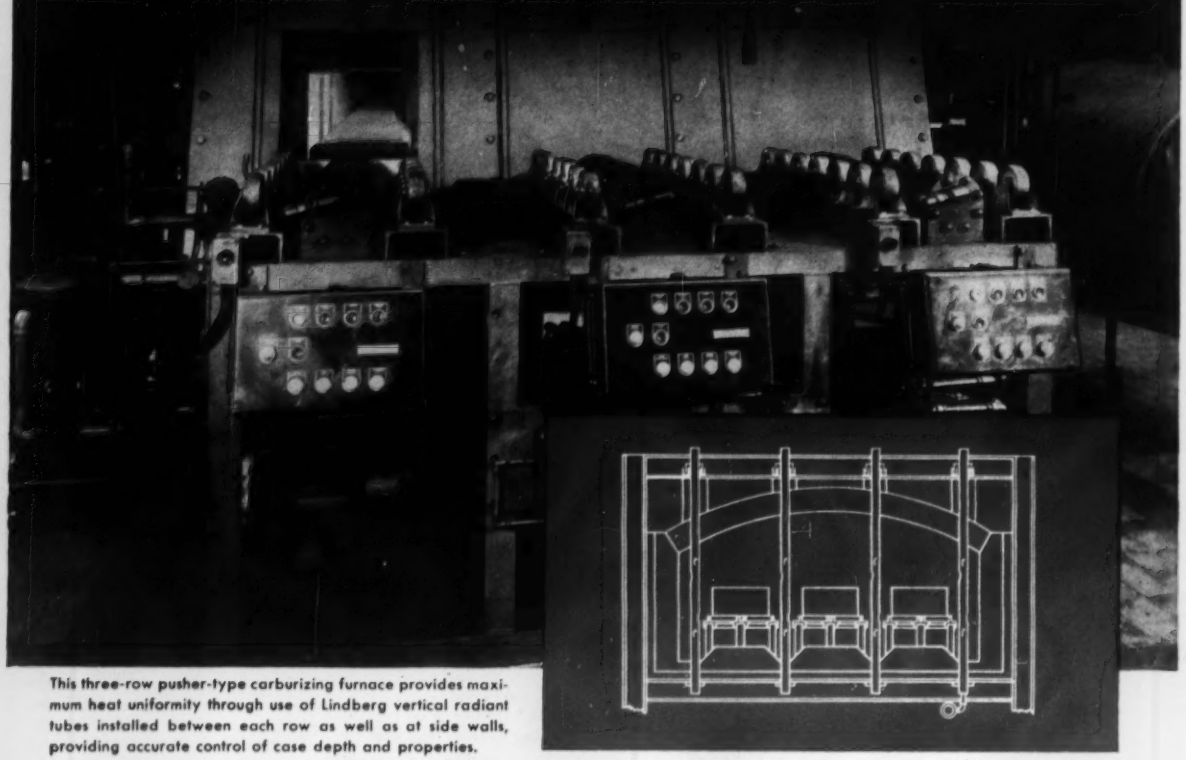
Heavy case depth held within .002″ uniformity



This three-row pusher-type carburizing furnace provides maximum heat uniformity through use of Lindberg vertical radiant tubes installed between each row as well as at side walls, providing accurate control of case depth and properties.

New Efficiency in Carburizing With Lindberg Vertical Radiant Tubes

This highly efficient furnace with Lindberg vertical radiant tubes carburizes 650 lbs. of gears per hour with an effective case of .055″. Case depth is held within .002″ uniformity. Gears range up to a maximum diameter of 15″ and 30 lb. weight. In this operation, furnace is adjusted to .80% carbon but can be set to control content of the case at any level desired.

Furnace rows are equipped with five zones of control, Zones 1, 2 and 3 operating at 1700° F. for carburizing. In Zone 4, at 1700° F. for diffusion, atmosphere is adjusted to the carbon content specified for the case. In Zone 5, temperature drops to 1500° F. for quenching.

An endothermic carrier gas atmosphere enriched with a hydrocarbon gas is used and gears are Gleason Press quenched.

The Lindberg vertical radiant tube used in this installation weighs only 36 lbs., is only 84″ long. Can be changed easily in a few minutes.

Exclusive "dimple" design insures uniform heat over designated length of tube.

Special green silicone enamel coating resists carburization and lengthens tube life.

For any type of industrial heating or processing operation, Lindberg provides a complete analyzing, designing and construction service including completed installation in your own plant. To get immediate, on-the-spot service from an expert Lindberg engineer call your nearest Lindberg Field Office (see classified section of your telephone book) or write us direct.

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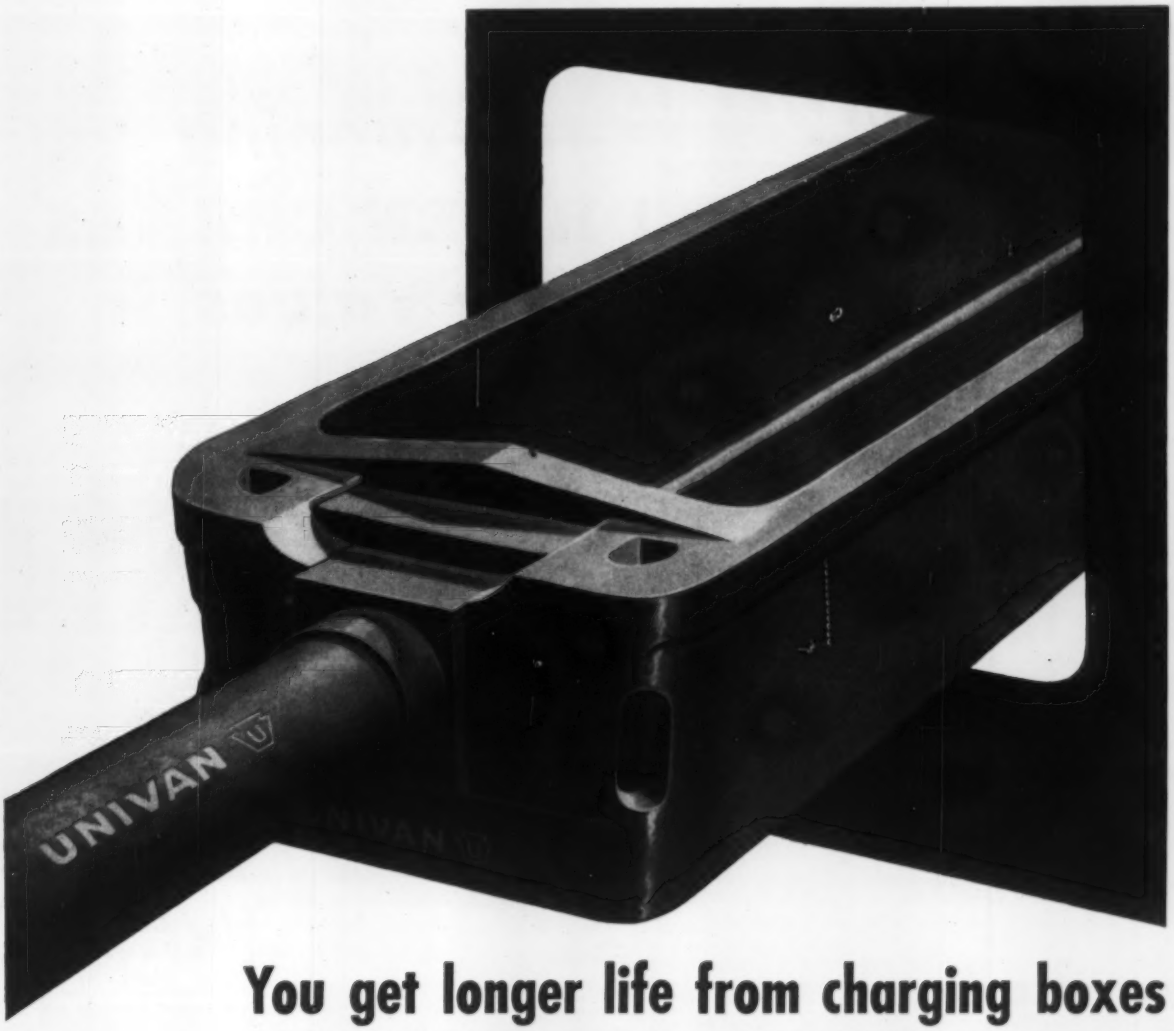


You get longer life from charging boxes and peels cast in nickel UNIVAN steel

This special alloy steel has definite advantages over carbon steel. Due to its nickel content, for instance, UNIVAN has greater resistance to firecracking. And its high tensile strength provides greater resistance to torsional twist and shock.

So, if you're having trouble with excessive firecracking, distortion or breaking of your present castings, UNIVAN castings may be the answer to your problem—whether they be charging boxes, peels, bearing covers, couplings and spindles, tongs and tong levers.

We'll be glad to give you more information about the performance of UNIVAN castings on the toughest jobs. Or, if you want prompt service, just send us your blueprints for a quotation.

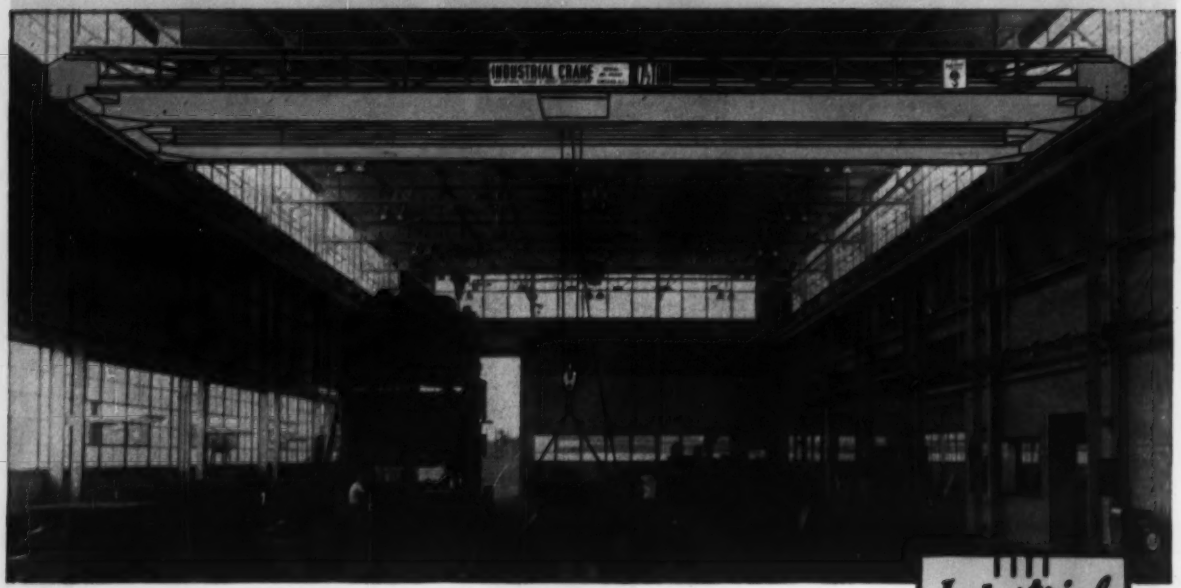
BLAW-KNOX

BLAW-KNOX COMPANY

Union Steel Castings Division . Pittsburgh 1, Pennsylvania

UNION PRODUCTS: charging boxes • peels • bearing covers • slag pots • tongs and tong levers • universal couplings and spindles • gears and pinions • ingot cars • charging box cars • special UNIVAN and ARMOR steel castings

Industrial top-running MOTOR DRIVEN CRANES are Better Values



The Industrial 7½ ton crane in photo is equipped with 5 step variable speed push button control to facilitate delicate handling of expensive dies.

Industrial CRANES

The high quality built into Industrial Cranes means more production and less down time to the user. A glance at a few of the outstanding features will show you the better value that is built into every Industrial Motor driven crane. The best crane for the long run.

- **Rolled Forged Steel, heat treated wheels.***
- **Long-life, precision ball and roller bearings throughout.**
- **All welded, precision jig-bored end trucks for true smooth operation.**
- **Two large size gusset plates at each end-truck assuring permanent squareness.**
- **Rugged type outrigger for additional lateral strength.**
- **Special push button control for efficient operation from floor or cab control.**
- **All Industrial cranes including underhung types designed for easy erection at job site.**

*Standard on heavy duty models

Consult with Industrial Crane & Hoist for assistance in solving your Materials Handling Problems

Industrial Motor Driven Cranes are designed for all types of service, in light, regular, and heavy duty models

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Representatives in Principal Cities

DESIGNING WITH ALUMINUM

NO. 15

This is one of a series of information sheets which discuss the properties of aluminum and its alloys with relation to design. Extra or missing copies of the series will be supplied on request. Address: Advertising Department, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California.

ALUMINUM vs. STEEL STRUCTURALS

THE light weight, strength and corrosion resistance of aluminum alloys are causing them to be increasingly considered for applications where structural steel has been the traditional material of construction.

Aluminum weighs about 0.10 lb. per cubic inch, structural steel about 0.28, or nearly three times more. Aluminum structures weigh from 35% to 70% of their steel counterparts, which suggests a number of economic advantages to be gained through the use of aluminum:

1. Ease of handling light sections in the fabricating shop.
2. Reduced shipping and erection weight—hence, the possibility for greater off-site fabrication.
3. Reduced erection time with attendant reduction of construction costs and earlier placement of the structure in service.

It also points up applications wherein the fullest advantage of weight reduction is to be gained:

1. Long-span structures in which the greatest load is the weight of the structure itself.
2. Structures whose component parts must be shipped long distances and erected in difficult-to-reach locations.
3. Structures which are difficult to erect or which must be erected without the aid of heavy lifting equipment.
4. Structures in which demountability or portability is a requirement.
5. Mobile structures which impose a dynamic load on their supports and may have power requirements.
6. Structures located in areas where expensive foundations are required.
7. Applications which impose additional loads on existing structure.

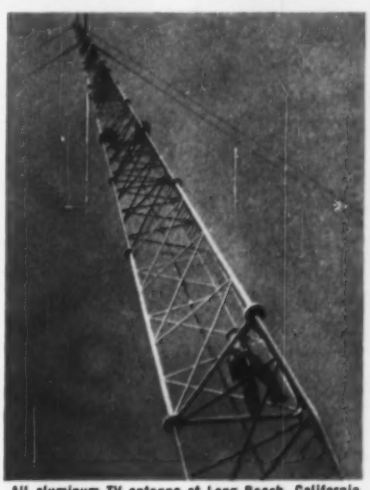
Aluminum alloys are highly resistant to atmospheric corrosion. No surface treatment is required for most of the alloys used in structural applications. This is an obvious advantage over structural steel which must be initially protected by galvanizing or painting, and periodically repainted during the lifetime of the structure.

Corrosion resistance therefore suggests additional economies, beyond those found in weight savings, for aluminum structural applications:

1. Exposed structures, particularly those located in industrial atmospheres and areas of high humidity.
2. Structures which are expensive to repaint because of location or intricacy of detail.
3. Structures which must be taken out of service to allow maintenance.
4. Structures composed of light members in which arbitrary corrosion allowances determine the minimum thickness of steel members permissible in the design.
5. Applications in which an attractive, permanent finish is required.

Well-designed aluminum structures weigh considerably less than similar steel structures. This is due not only to aluminum's low density in relation to steel, but also to the strength and elastic properties of the aluminum alloys. Figure I lists certain of the typical and minimum tensile properties of several of the aluminum alloys commonly used in structural applications, and those of structural steel.

It will be observed that the tensile yield strength of alloy 6061-T6 compares with the yield of structural steel while the ultimate tensile strength of alloy 2014-T6 is the same as the ultimate of steel. Since permanent deformations in a structure caused by stresses in excess of the yield strength of the material are generally considered undesirable, design working stresses are usually selected by applying a suitable factor of safety to yield strength. On the basis of yield strength, then, a 6061-T6 tension member would carry the same load as an identical structural steel member and weigh less than ⅓ the steel member.



All aluminum TV antenna at Long Beach, California. Prefabricated in approximately 20-foot sections.

Some designers apply a somewhat greater factor of safety to the tensile yield strength of the aluminum alloys than to that of steel because of the difference in spread between yield and ultimate. It is important to note that even if the same safety factor were applied to the minimum ultimate tensile strength of 6061-T6 and structural steel, the 6061-T6 member would weigh less than half that of a steel member carrying an equivalent tensile load. In addition, the aluminum member would provide a greater margin of safety against permanent deformation.

FIGURE I		Typical Tensile Properties			Minimum Tensile Properties		
Metal	Alloy and Temper	Yield Strength PSI	Ultimate Strength PSI	Elongation % in 2"	Yield Strength PSI	Ultimate Strength PSI	Elongation % in 2"
Al.	2014-T6*	65,000	71,000	10	55,000	60,000	7
Al.	5083-O†	22,000	44,000	21	18,000	40,000	16
Al.	5083-H112§				24,000	40,000	12
Al.	5083-H113†	33,000	46,000	16	31,000	44,000	12
Al.	5086-O†	17,000	38,000	22	14,000	35,000	18
Al.	5086-H112†	19,000	39,000	14	18,000	36,000	8
Al.	6061-T6	40,000	45,000	17	35,000	38,000	10
Al.	6063-T5	25,000	30,000	12	16,000	22,000	8
Al.	6063-T6	30,000	35,000	12	25,000	32,000	8
Steel	ASTM-A7	38,000	60–72,000	30	33,000	60,000	24

*Fusion welding of 2014 not recommended. †Plate properties.
§As extruded. Typical mechanical properties vary according to size and shape of structural sections.

PLEASE TURN TO NEXT PAGE

In many cases, the stiffness of a structural member is the governing factor in design and stiffness is a function of the modulus of elasticity of the material of construction. The modulus of elasticity of the aluminum alloys is about 10,300,000 PSI while that of structural steel is 29,000,000 PSI. Hence, it will be seen that an aluminum beam will deflect the same amount under its own weight as an identical steel beam, since the aluminum beam will weigh but ⅓ the steel beam. Under the same applied load, the aluminum beam will deflect up to almost three times that of the identical steel beam depending upon the relation of dead load to total load.

If, under the same conditions of loading, stiffness equal to steel is required of an aluminum beam, it can be achieved—with substantial savings in weight—by selecting an aluminum beam having increased section properties. For example, a 7" aluminum I-beam weighing 5.42 lbs. per foot has three times the moment of inertia of a 5" steel I-beam weighing 10.0 lbs. per foot, nearly twice as much. Thus, equal stiffness is provided and stresses due to bending in the aluminum beam will be less than half those in the steel member.

To take full advantage of the high strength of the aluminum alloys, deflection criteria should be closely examined to make certain that the design is not needlessly penalized by arbitrary and unnecessarily severe deflection limitations. Reducing deflection through the use of rigid framing and continuity should not be overlooked. The maximum deflection of a uniformly loaded, continuous beam of two equal spans is less than half that of a simply supported beam if unsupported length, loading and beam section properties are equal.

The elastic modulus also affects the stability of compression elements. For example, the load to cause elastic instability of an axially loaded slender column is directly proportional to the modulus of elasticity of the metal used. Hence, an aluminum column will carry but ⅓ the load of an identical steel column, but will weigh only ⅓ as much as the steel column. By selecting a somewhat heavier aluminum section, it is possible to support a load equal to that of the steel column with substantial weight reduction. For example, an 8" x 8" wide flange aluminum column will support about one-half again as great an axial load as an 8" x 5" wide flange steel column of the same length before becoming elastically unstable. Yet, the aluminum member weighs 11 lbs. per L.F., the smaller steel section 20 lbs. per L.F.—nearly twice as much.

Aluminum's lower elastic modulus has a beneficial effect in absorbing impact loads and reducing stresses caused by inexact fit-up of members in a structure. Because of the lower modulus, stresses induced by temperature changes in restrained members are less for aluminum than for steel. This is in spite of the fact that the coefficient of thermal expansion of aluminum is about 0.000012 in/in/°F, or almost twice that of steel.

Procedures involved in the fabrication of aluminum and steel structures are comparable. As with steel, joining can be accomplished by riveting and bolting. Aluminum rivets and bolts are usually used in aluminum structures for maximum corrosion resistance. Either hot or cold driven aluminum rivets can be used. Holes for aluminum rivets and bolts in primary structural members are drilled or subpunched and reamed and aluminum members are sawed, sheared or cut with a router rather than flame cut.

Aluminum members can also be joined by welding. Allowable stresses across welds are reduced to offset a certain reduction in strength in the heat affected zone. Two new alloys, 5083 and 5086, recently developed by Kaiser Aluminum, show great promise for welded aluminum structural work. Inert-gas arc welds of these alloys in plate and sheet exhibit joint efficiencies varying from 80% to 100%, depending on the original temper of the base plate.

Hence, the use of standard aluminum structural shapes offers exciting possibilities to the designer in the development of efficient structural solutions. In addition, the extrusion process makes possible the economical production of special aluminum sections for unique design situations. Kaiser Aluminum engineers, experienced in the design of aluminum structures, will welcome the opportunity to assist you in designing with aluminum.

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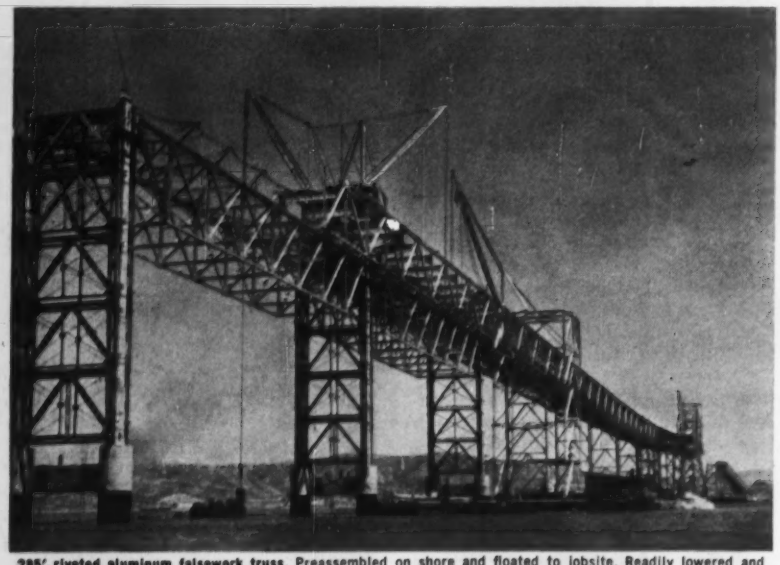

285' riveted aluminum falsework truss. Preassembled on shore and floated to jobsite. Readily lowered and moved between towers in its use as erection platform for construction of San Rafael-Richmond, California bridge. Weight 110 tons. Estimated weight in steel approximately 300 tons.

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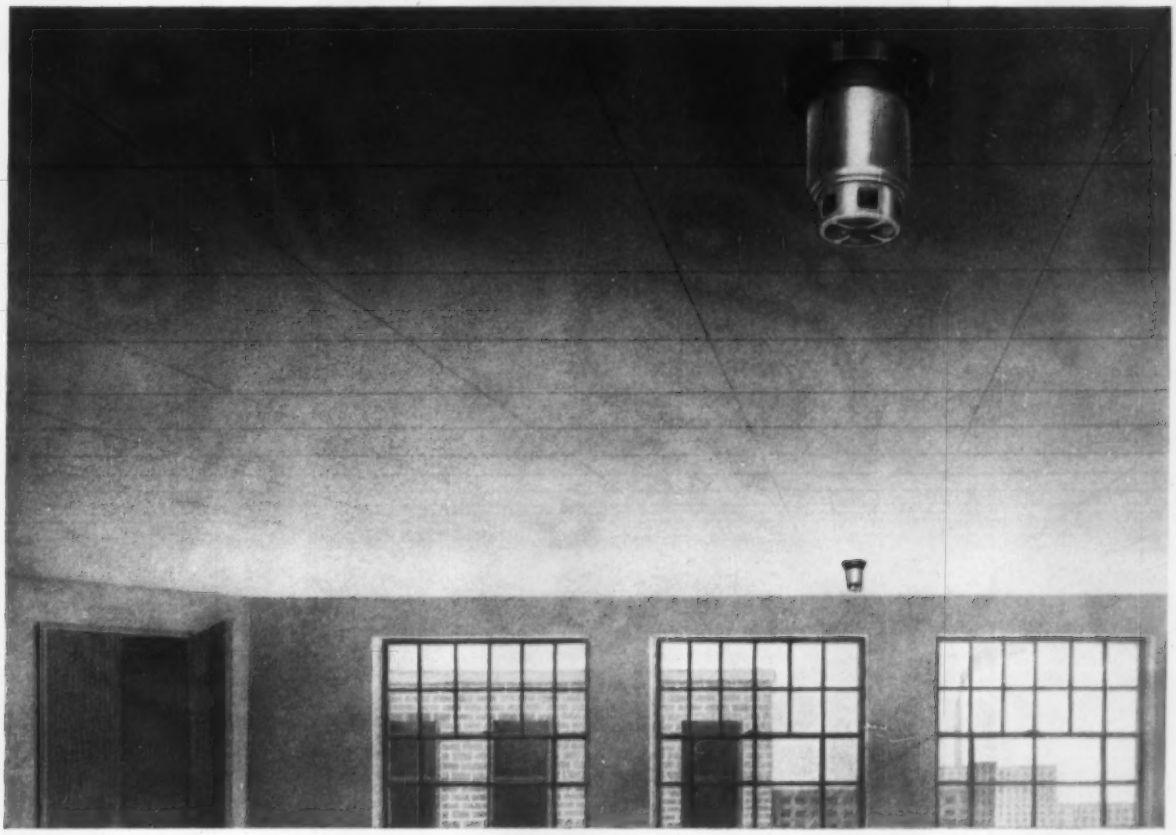

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The C-O-TWO Pre-Detector System has been subjected to extensive testing and carries Underwriters' Laboratories, Inc. listing, as well as Factory Mutual Laboratories approval. Proven pilot installations have been made in such diversified properties as a television station, an electric power company network analyzer room, a railroad signal tower, an airline flight training equipment room and the offices of an insurance company.

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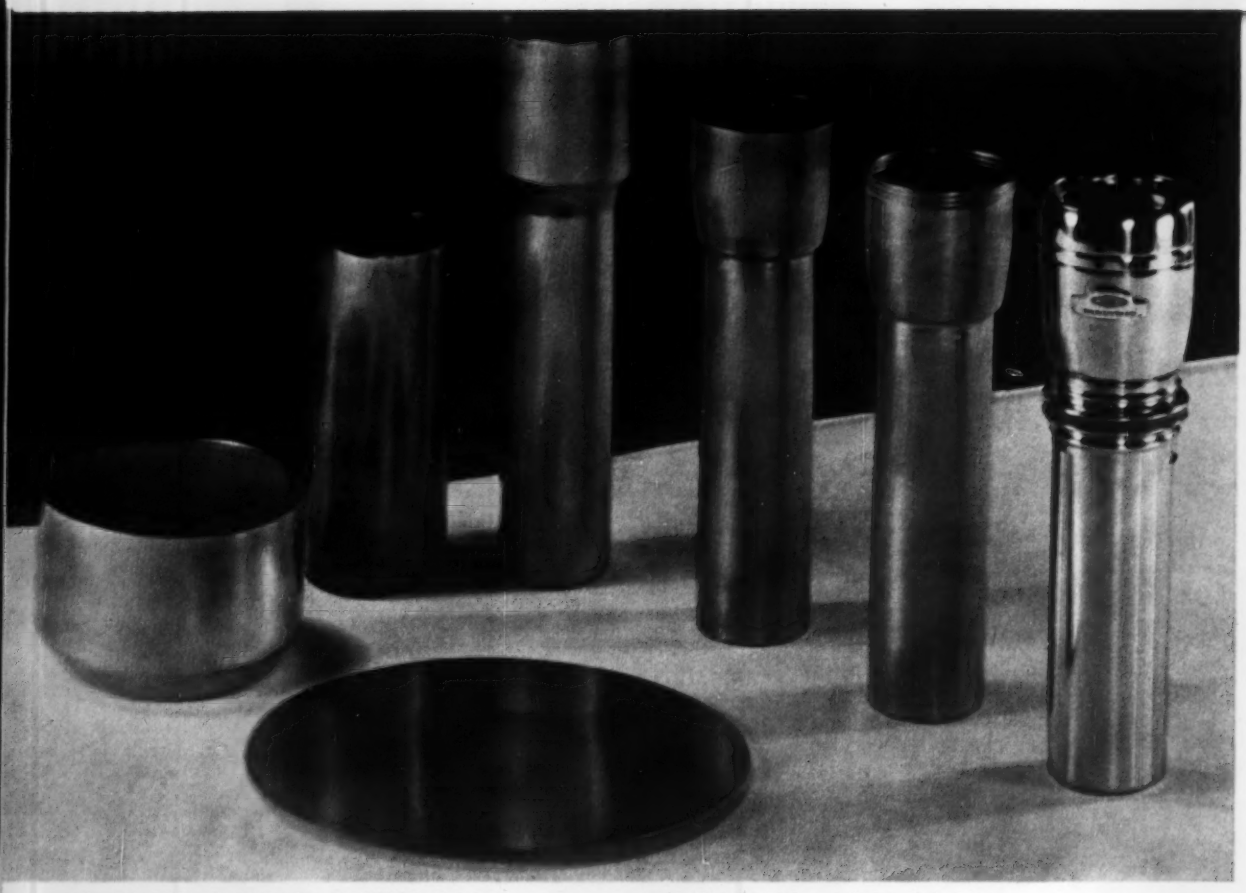


1. The Evolution of a flashlight, from electro-copper coated steel strip to finished product . . .

$100,000-A-Year Production Idea

Take a stroll through the Blake Manufacturing Division of Ray-O-Vac Company. Then you will understand how this firm arrived at its slogan: "Miracles in Metal."

In its plant at Clinton, Massachusetts, Ray-O-Vac produces the largest line of flashlights in the world, all of modern styles and designs, ranging from pocket models to five-cell spotlights and Hunter Lanterns. The volume moving off the production lines, wrapped and packaged for display, runs into the millions each year.

From start to finish, the plant is modernly equipped and efficiently organized. Through experience and ingenuity, it has developed production techniques that are in many ways unique. For example, take the manufacture of flashlight cases.

On models where brass traditionally has been most used, Ray-O-Vac is now making cases of steel. Because both types of cases are chrome finished, you can't tell a brass flashlight from a steel one by looking at it. They are both corrosion resistant, highly polished, and beautifully contoured.

But try standing on one. The brass case flattens out. The steel case doesn't. Ray-O-Vac has come up with a rugged product that gives it a quality advantage in competitive markets. The interesting fact is that it has done this with production savings that run from 17 to 29 per cent.

• **How It Was Done**—As in most worthwhile ventures, the transition wasn't made overnight. Blake Division engineers first began experimenting with plain drawing quality steel. The depth of the draw required for a flashlight case is an extremely severe one. No matter how they designed their dies or regulated the drawing cycle, they couldn't find a plain steel that would do the job.

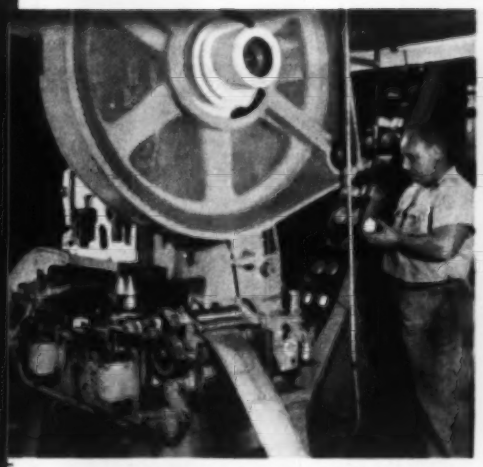
Next, they called in the specialty strip men from Thomas Strip Division of Pittsburgh Steel Company. Thomas development engineers joined Blake's, and together they began exploring the possibilities of special drawing quality steel with an electrolytic coating of copper. The copper coating provides a good die lubricant and a good base for chrome plating.

One year and nine trial lot shipments later, they came up with the answer. Today, Blake is using .020 gage non-scalloping deep drawing quality strip steel produced by special processing techniques developed at Thomas, electro-copper coated on both sides, 6 9/16 inches wide in 450-pound coils.

This may sound complicated, but specialty strip steel such as this is the forte at Thomas, and they can produce it with consistently uniform quality that gives Blake a maximum yield from every coil.

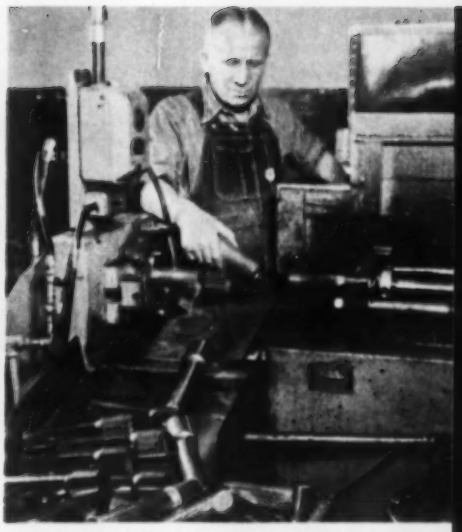
• **In Production**—To watch these coils of electro-copper coated strip become flashlight cases at Blake gives you the impression that if there is nothing miraculous involved, at least the engineers were closely akin to technical wizards.

The coils are fed into a double action press. It cuts a round blank from the strip that is 6.398 inches in diameter. From there, in a series of four drawing operations without annealing, this round, flat disc of cold steel becomes a single-piece flashlight case 7 1/2 inches long with a battery case diameter of 1.517 inches



2. Begins at this double action press that blanks out a circular disc and draws it into the shape of a cup.

3. The Cup Becomes a Tube as the cold steel flows under tremendous pressure, then shaped into a...



4. Flashlight Case on a horizontal press that also forms the flashlight head.

and a formed head with a diameter of 1.945 inches (photo No. 1).

As the first press has a double action (photo No. 2), it also makes the first draw. Here's where the "Miracles in Metal" begins as the steel flows under tremendous pressure, producing a smooth-surfaced and even-edged cup 3⅛ inches deep with a base diameter of 3.480 inches. The redraw press (photo No. 3) makes two draws with the maximum reduction on each. It turns out a closed end tube 5 inches long and 1.954 inches in diameter.

The tube is then fed to a horizontal redraw press (photo No. 4) that makes a further reduction, forming the cell case and head. The head is trimmed, shaped, roll threaded and knurled. Finally, the case is given a heavier copper plating, buffed and polished, chrome plated, then delivered to the assembly lines (photo No. 5).

Compared to the fabrication of cases with brass, electro-copper coated strip is fabricated more rapidly and requires less processing. Two annealing and pickling operations and one redraw have been eliminated. Fewer tubes need to be stocked ahead of press operations. From the first press through the last forming operation, Blake's equipment produces steadily at a rate of about 1,400 pieces an hour.

• **The Pay-Off**—Savings, including the lower initial cost of electro-copper coated steel strip compared to brass, range from 3 cents to 6 cents per flashlight case on models produced from steel. On three popular models alone, these savings amounted to more than $100,000 last year.

Add to this the important fact that Ray-O-Vac is building a better quality flashlight with advantages that increase sales, and the slogan "Miracles in Metal" takes on increased significance.

If you are fabricating products from more expensive metals, why not consider the use of Thomas precoated strip steel? Perhaps you can accomplish similar savings and improve your product.

Thomas strip begins with good steel of correct analysis in a variety of tempers. It is cold rolled to exacting tolerances. Then it can be coated electrolytically with zinc, lead alloy, copper, brass, nickel or chrome . . . hot dip tin and lead alloy coated . . . or lacquer coated in different colors. It offers the luster of planished or buffed finishes. Altogether, Thomas produces the widest range of strip steel specialties in the industry.

Thomas Strip is more than a product, it is a production idea. Why not call a representative to discuss your problems with you and offer suggestions. You will find him ready to give you prompt, personal service without obligation. *Write for descriptive literature.*

5. Finished cases receive a chrome plating. Assembly of switches, lens rings, springs, caps, etc. is done on one of eight lines such as this, producing at rates up to 30,000 packaged flashlights a day.

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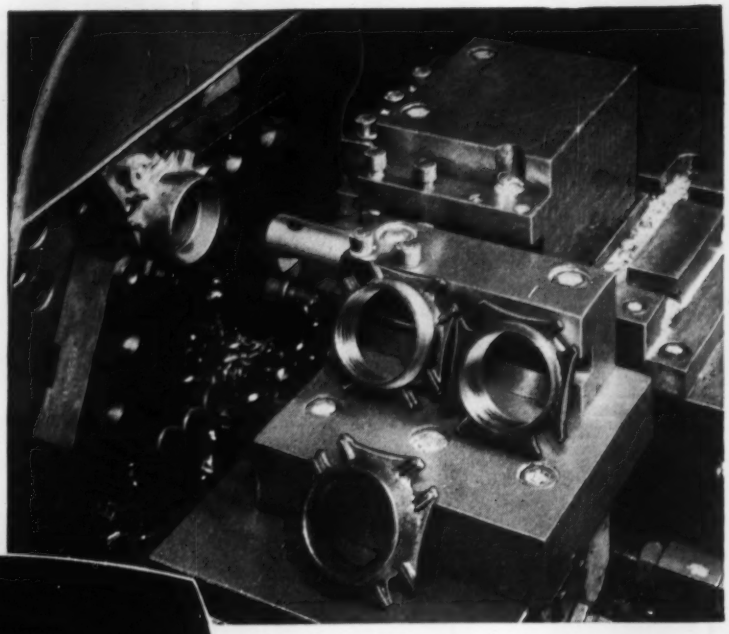
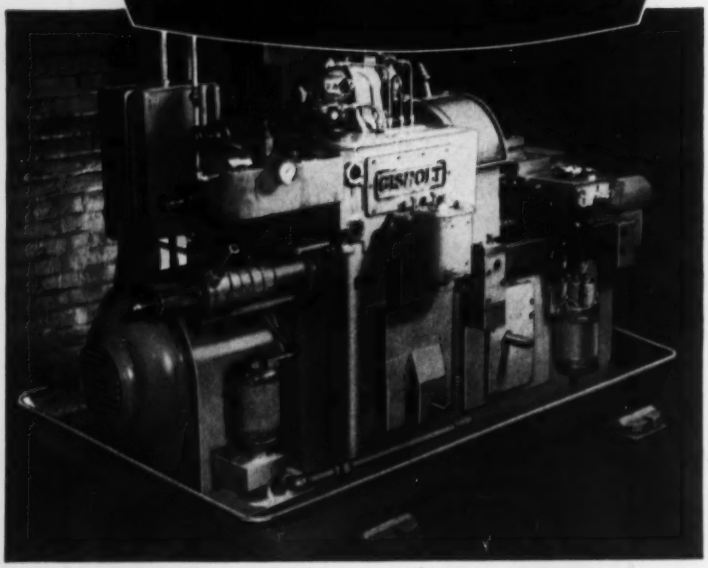


cuts costs with—

GISHOLT No. 12 HYDRAULIC AUTOMATIC LATHE



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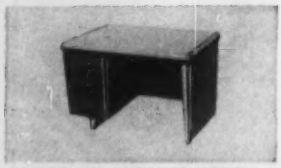

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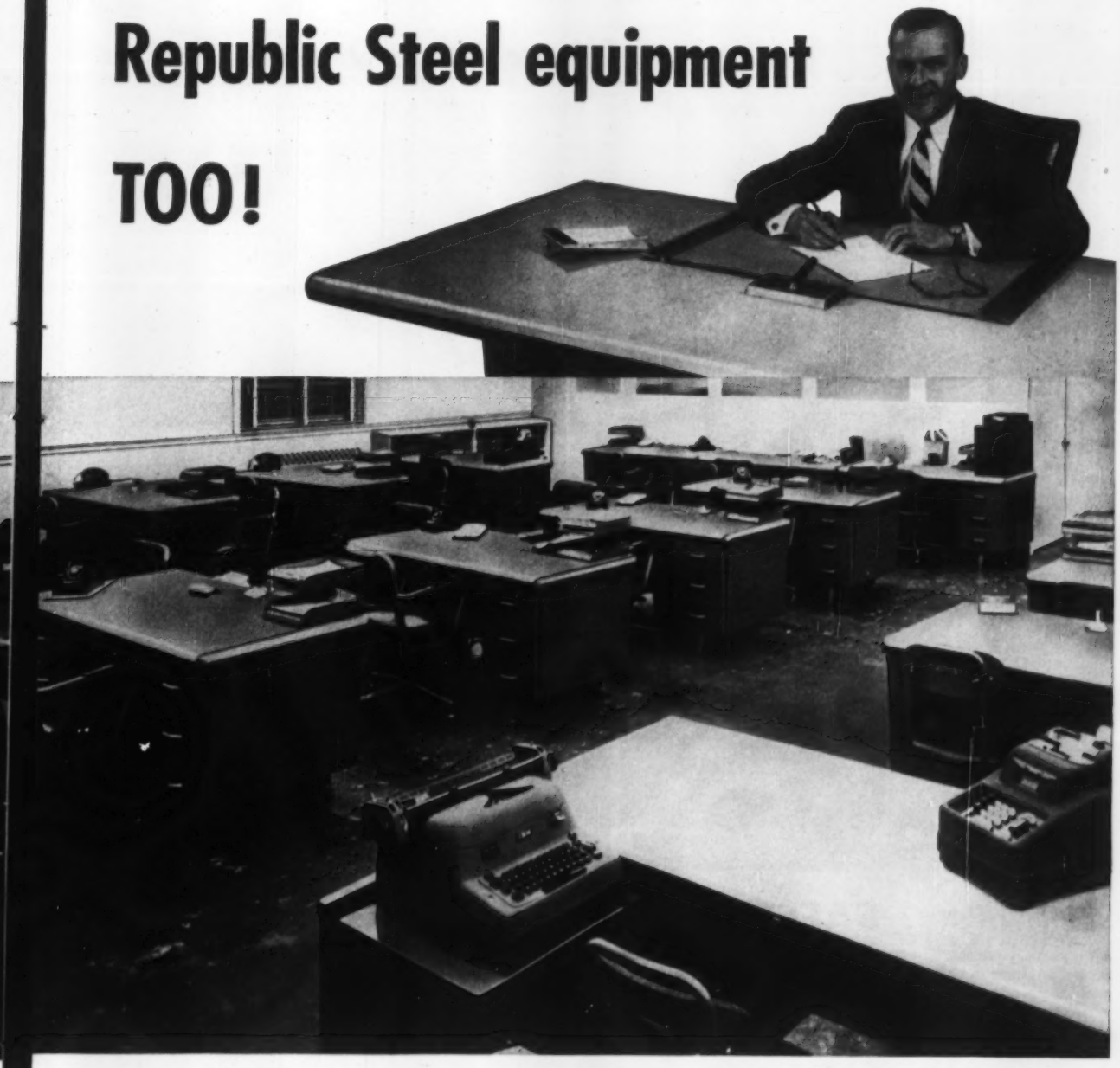

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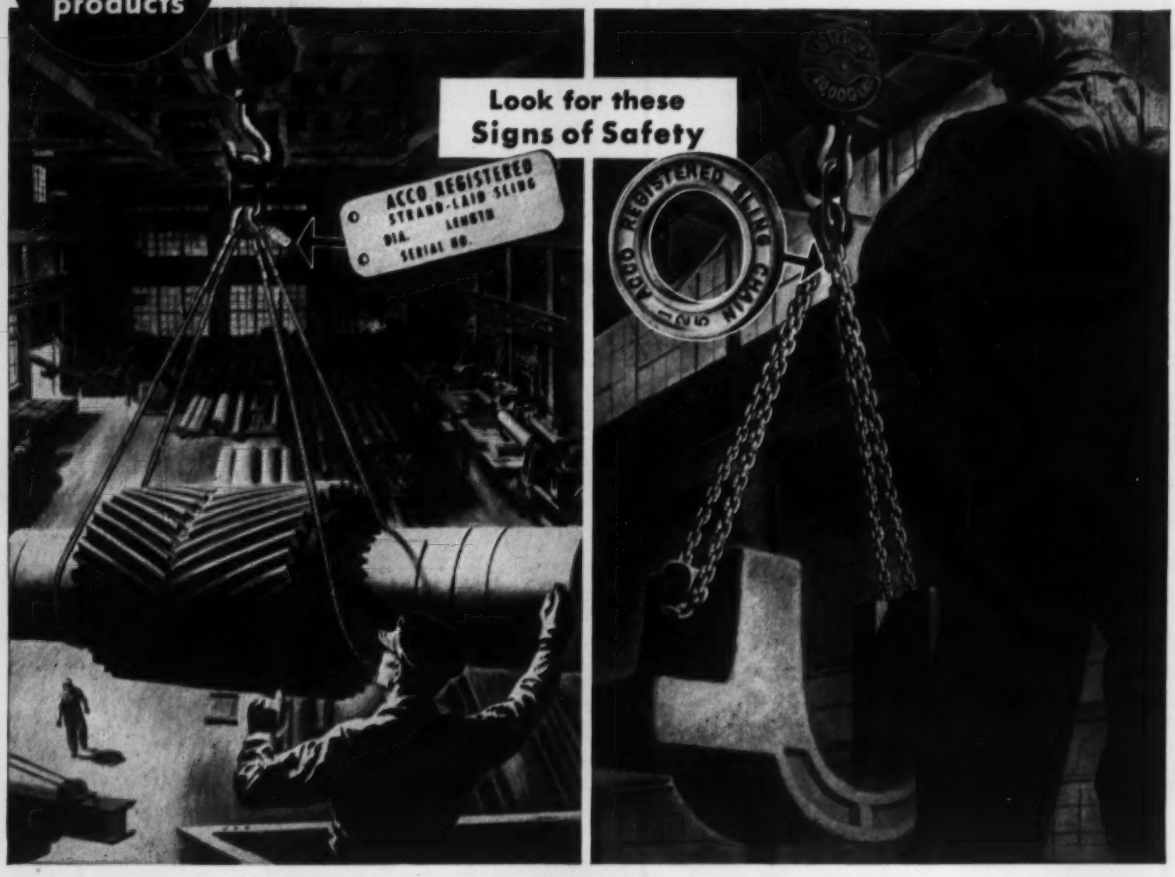

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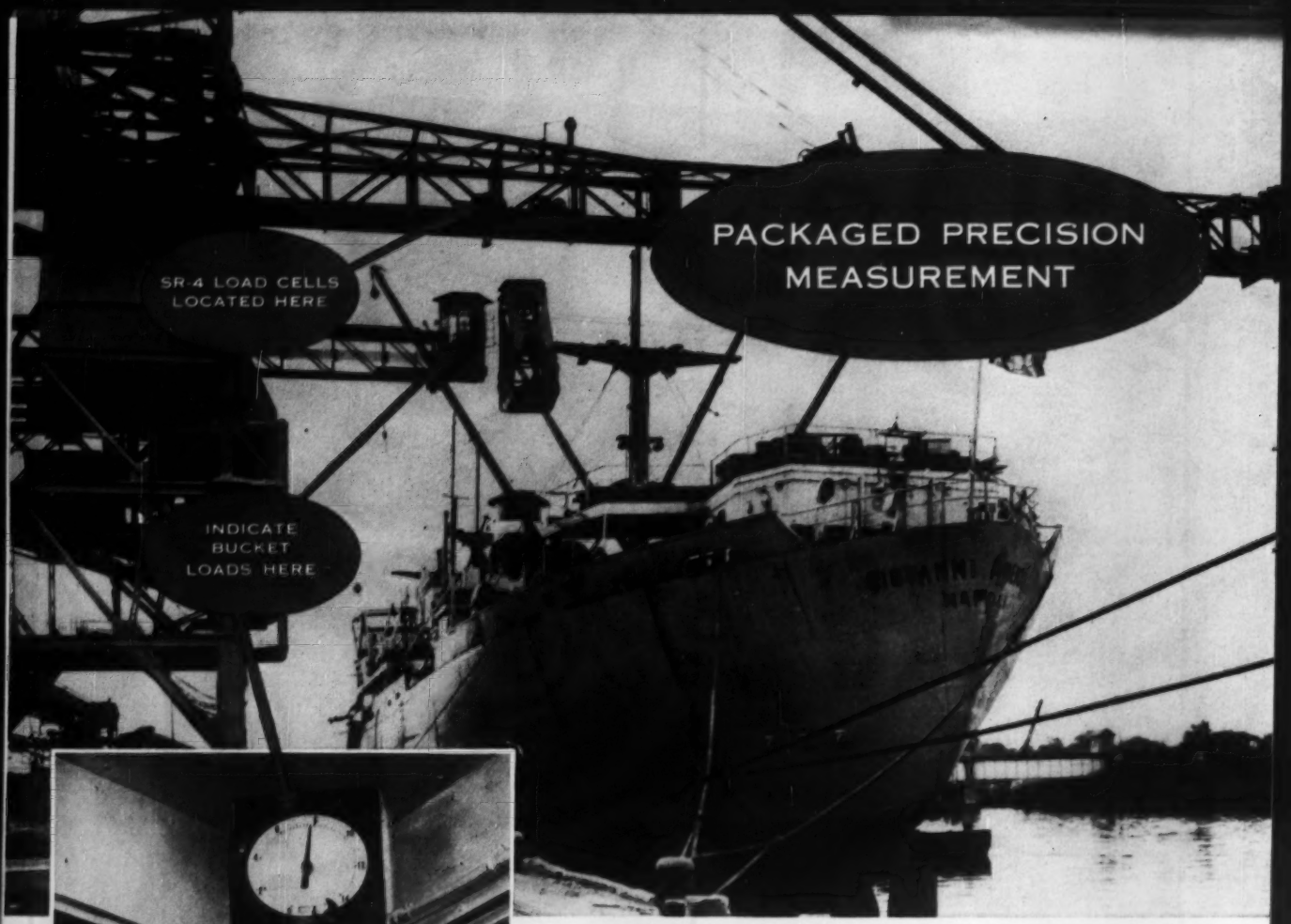

Baldwin SR-4 System indicates and continuously totalizes ore loads in the crane cab (above). The operator has a continual check on the load being carried by the clamshell.

At Alabama State Docks this Heyl & Patterson crane...

unloads ore faster by using SR-4® automatic weighing system

Baldwin's "Packaged Precision Measurement" can cut your ore handling costs. That's been proved at the Alabama State Docks, Mobile, Alabama. There a Heyl & Patterson unloading crane is using Baldwin SR-4 load cells and indicator to weigh electrically clamshell buckets of ore.

This Baldwin SR-4 automatic weighing system benefits this user three ways:

1. **Faster handling:** The bucket does not have to be stopped to determine weight since its weight is being measured by two 20,000 pound load cells in the sheave block. More ore can be handled by the unloading equipment each shift, reducing handling costs.
2. **Easy operation:** A large indicator dial in front of the operator tells him when to add the weight on the totalizing counter. The indicator totalized the weights measured by two distant SR-4 Load Cells and zeroes out all but net weight of ore.
3. **Low maintenance:** SR-4 Load Cells have no moving parts to wear out. They are sealed against air-borne dust They are giving accurate, dependable service.

Baldwin SR-4 Load Cells can solve your weighing and force-measuring problems. Write for our *new* Bulletin 4301. It's loaded with detailed information on typical applications and instrumentation for these unique devices. It tells you how to use them for local or remote indication, recording, signaling or process control. Use coupon today!

Department 3246
Baldwin-Lima-Hamilton Corp.
Philadelphia 42, Pa.

(In Canada: Peacock Bros., Ltd., Montreal, Quebec)

☐ #4301 (SR-4 Load Cells and Load Beams)

☐ #4304 (SR-4 Crane Scales)

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Address_____

City_____ Zone___ State_____

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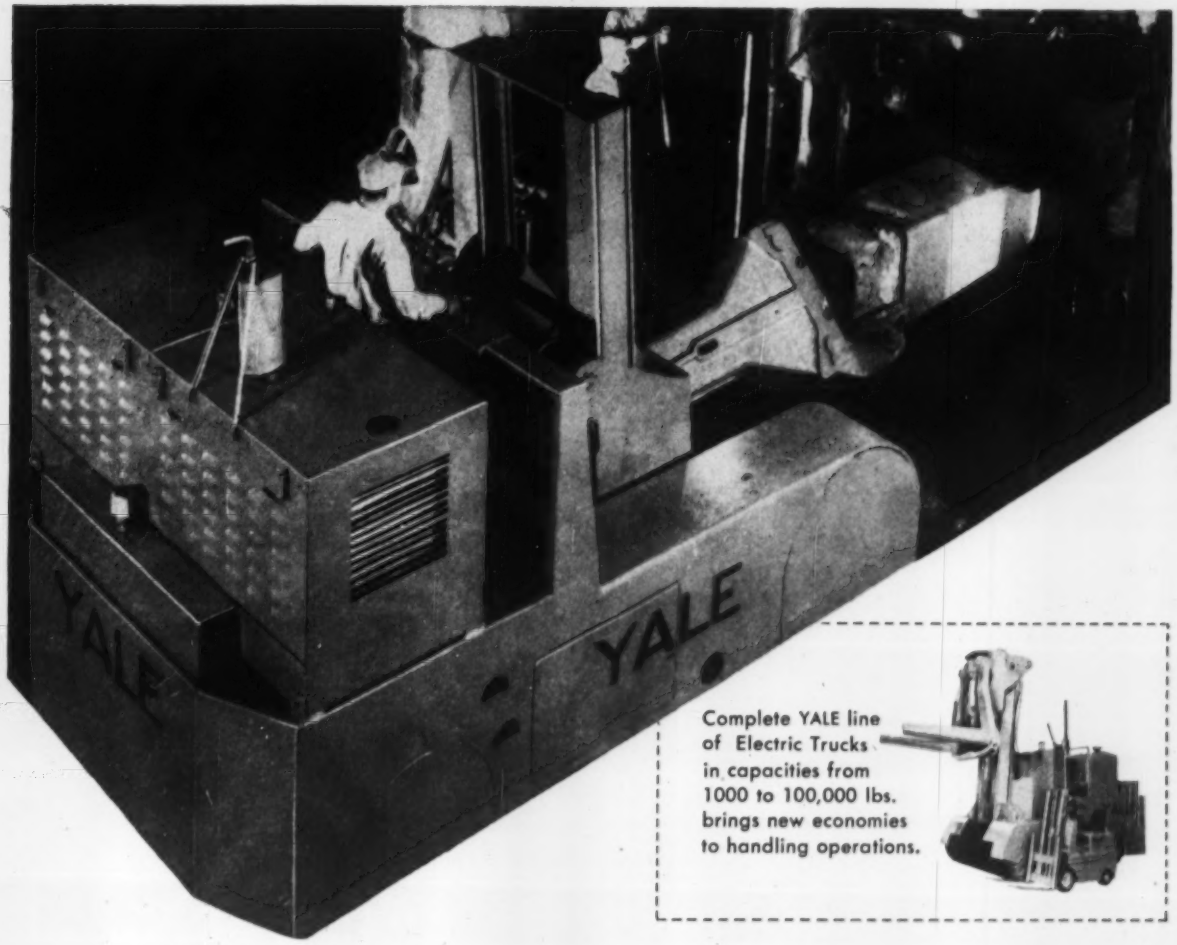
BALDWIN-LIMA-HAMILTON



Complete YALE line of Electric Trucks in capacities from 1000 to 100,000 lbs. brings new economies to handling operations.

Yale Truck speeds handling of 5 ton ingots

. . . AND BEHIND THE "FIRING LINE" OTHER YALE TRUCKS BRING OUT-OF-THE-ORDINARY SAVINGS TO ROUTINE HANDLING JOBS

This powerful YALE Industrial Truck is equipped with a special ingot-revolving attachment for faster forging of multi-ton ingots. Both truck and attachment are typical of YALE versatility in solving any sort of handling problem for the metals industry. On the production line, in receiving, shipping and storage, YALE Gas, Electric and Diesel Trucks work harder, last longer, handle smoother. They are engineered to resist shock loads better—thus reducing operator fatigue, extending truck life and increasing handling savings. For detailed information, send coupon today.

YALE* **INDUSTRIAL LIFT TRUCKS AND HOISTS**

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Gas, Electric, Diesel & LP-Gas Industrial Trucks • Worksavers Warehousers • Hand Trucks • Hand & Electric Hoists

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Please send detailed information on YALE Industrial
☐ Gas Trucks ☐ Electric Trucks
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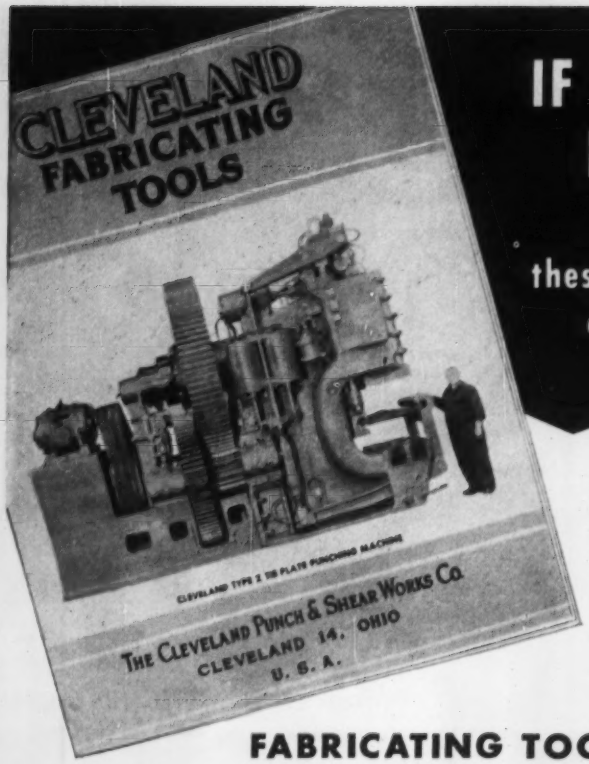
Company_____

Name_____ Title_____

Street_____ City_____ State_____

In Canada write: The Yale & Towne Manufacturing Co.
St. Catharines, Ontario, Canada



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you should have these new Cleveland catalogs

SEND FOR YOUR COPIES TODAY!

(Please write on your company letterhead.)

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- HORIZONTAL PUNCHES
- ANGLE SHEARS
- BAR SHEARS
- BENDING ROLLS
- STRAIGHTENING ROLLS
- BENDING and STRAIGHTENING MACHINES
- ROTARY PLANERS
- WALL RADIAL DRILLS

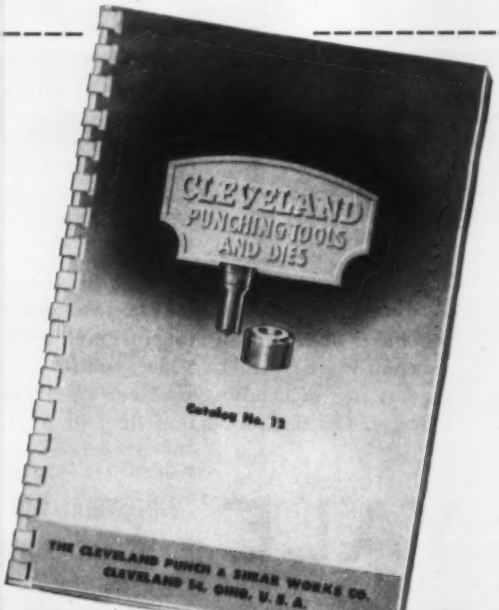
FABRICATING TOOL CATALOG No. 9

Just completed, this catalog illustrates and describes the various types of Cleveland machines used in the fabrication of plates, bars, angles, beams, girders and other structural shapes.

Should you desire additional information on any of the machines you'll find in this book, we'll gladly furnish you with it promptly.

PUNCH and DIE CATALOG No. 12

Here you'll find a description of the Cleveland System of Standardization which allows you to use economical standard rather than costly special punches. Its outline of the proper care of punches and dies will help reduce your replacement cost. It lists and illustrates all standard and special Cleveland Punches and Dies available for every make of punching machine and press. AA-M77



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We take pride in our 75 years of machine tool building. We believe that our years of experience assure you of the utmost in dependable and economical performance from every Cleveland machine whether special or standard.

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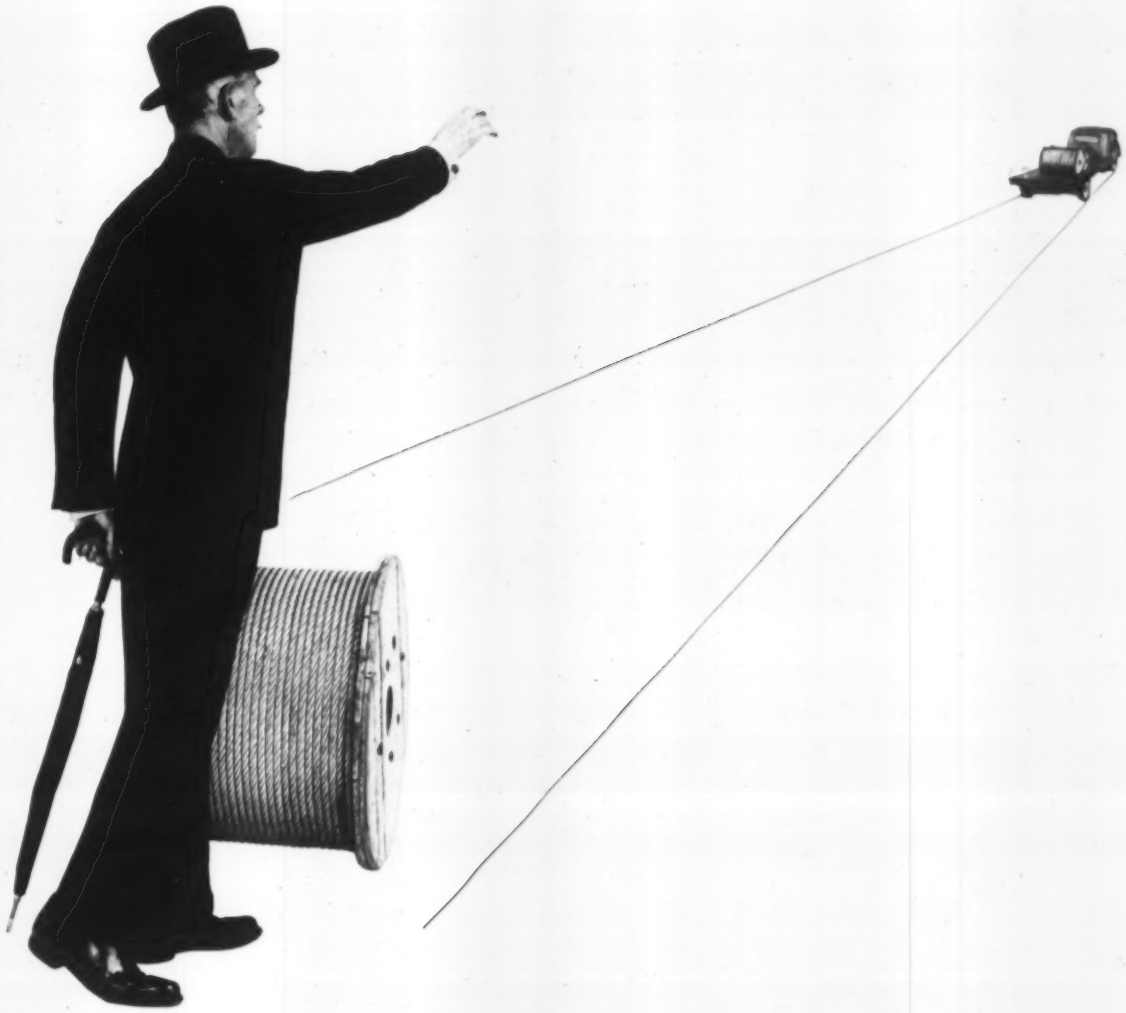

YOUR WICKWIRE ROPE DISTRIBUTOR SAVES YOU DOWN TIME

When the lack of the proper wire rope halts your production or your operations, thank your lucky stars that your helpful Wickwire distributor is only a quick phone call away. It's a wonderful feeling...to know you'll be getting exactly what you need from his warehouse stocks in only a few hours time.

Now contrast that with the cost in time, money and inconvenience of emergency shipments direct from a distant manufacturer.

In addition to saving on down time, your Wickwire distributor effects further economies by recommending the wire rope that will give you the longest service life, by minimizing your bookkeeping, inventory maintenance and transportation costs. He keeps your reserve stocks for you so that you don't tie up capital in stand-by materials, warehouse space and unnecessary stock insurance and handling.

Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

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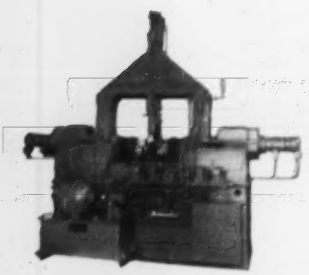
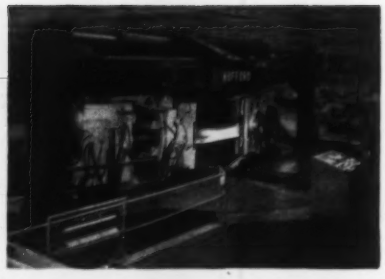
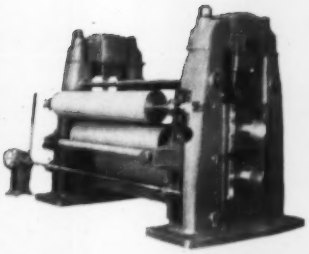
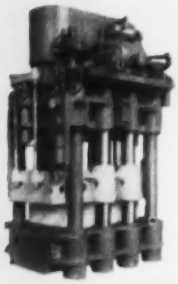
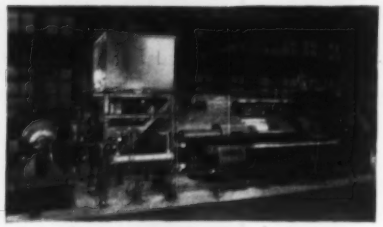


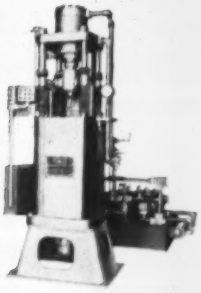


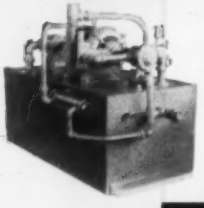


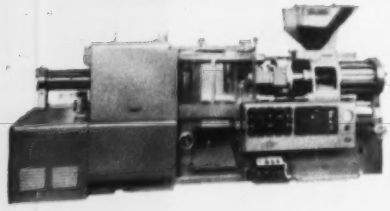
FEATURED on all types of hydraulic machines

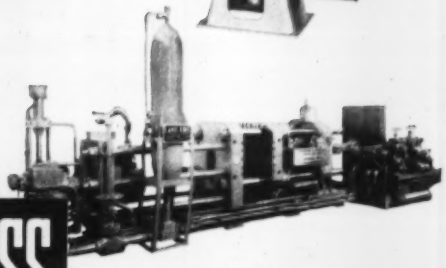






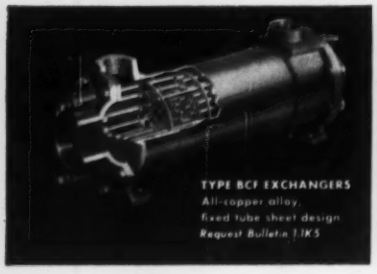






FULLY STANDARDIZED ROSS EXCHANGERS

for safe, dependable oil cooling



TYPE BCF EXCHANGERS
All-copper alloy, fixed tube sheet design.
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All-copper alloy, removable tube bundle, packed floating head design.
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TYPE CP EXCHANGERS
Cast iron or steel shell, admiralty or steel tubes, removable tube bundle, packed floating head design.
Request Bulletin 2.1K 5

On virtually every type of hydraulic equipment where dependable oil cooling is required, Ross Exchangers are regularly furnished as standard equipment.

Machinery builders feature them as key accessories. Users check specs to make sure they're included. That's because Ross Exchangers are not only unmatched for thermal efficiency, but they are ruggedly built to withstand punishing hydraulic shock. Tough, ductile seamless shells can well absorb the extra load.

Widely preferred throughout industry, Ross Exchangers have been job-proved on hydraulic machines of every description — die casters, metal drawing presses, plastic molders, extrusion presses, fluid drives, welders, powder metal presses, stretch wrap formers, gear shapers, stokers, broaching machines, paper-making machinery and others.

Compact in design, these adaptable oil coolers are furnished with convenient, accessible connections for ease of installation. Assembled from mass produced, stocked parts and sub assemblies, they're readily obtainable to answer your needs without costly "specials" in either engineering or fabrication.

For more information, write for bulletins listed above.

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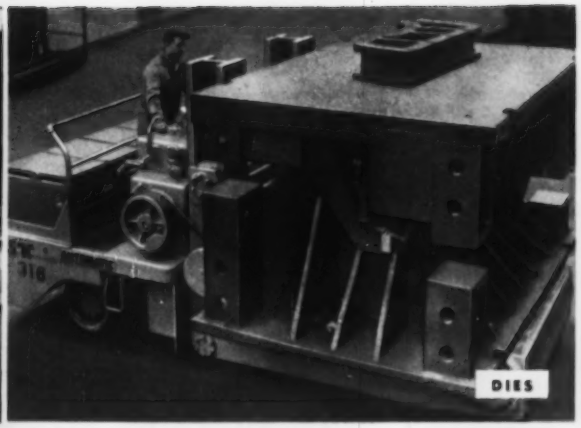

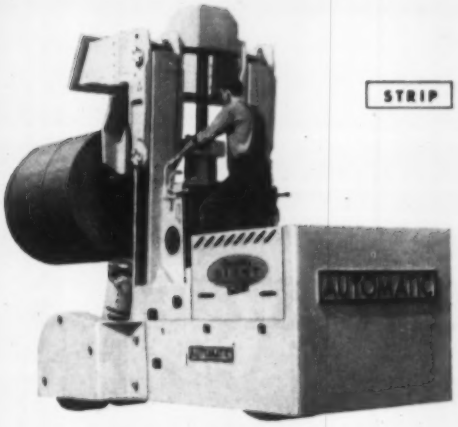

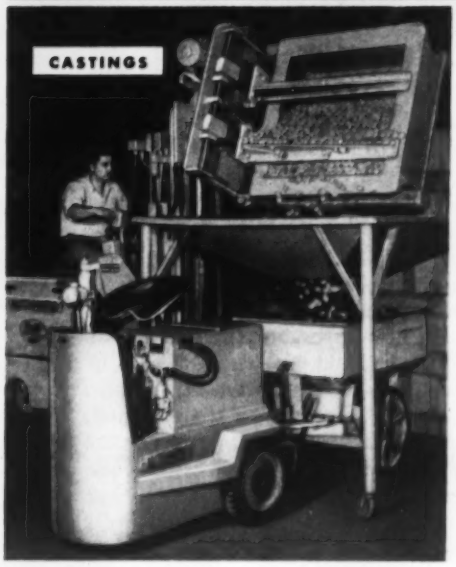

Automatic Trucks Handle Everything in Steel

Shown here are only five of countless ways that Automatic industrial trucks serve the Steel Industry. Today, as for nearly half a century, they are known for superior construction and operating efficiency. Freedom from down time has earned Automatic Trucks a reputation for low cost operation. There is an Automatic Truck keyed-to-the-job for *your* needs. Mail the coupon for full information.

Exclusive "Earn-Its-Own-Way" Plan makes it easy to lease an Automatic or purchase your truck with modest down and liberal deferred-payment terms.

Automatic®

WORLD'S LARGEST EXCLUSIVE BUILDERS OF ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

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Without obligation, please send me the facts on Automatic "Keyed-For-The-Job" industrial trucks, and free "Cost Cutter" booklet.

☐ Include "Earn-Its-Own-Way" data folder

Company Name .....
By ..... Title .....
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City ..... Zone ..... State .....

METALWORKING OUTLOOK META

New Ryerson stocks of 304L and 316L plates and sheets...

Solve stainless welding problems

One example of many special Ryerson steels and services

For many years, fabricators have had trouble with carbide precipitation in welding and annealing stainless steels. Now, new Ryerson stocks of low-carbon stainless solve this long-standing problem.

A small part of Ryerson stainless stocks—the nation's largest

Two types are available for quick shipment from your nearby Ryerson plant—plates and sheets in Type 304L and Type 316L. (Sheets are available in 10 to 16 gauge inclusive. Plates from 3/16″ to 2″ in thickness.) Both types generally eliminate the need to anneal after welding—can be used in place of more expensive stabilized stainless when stress relieving is necessary.

With the addition of these new low carbon types, you can now draw on Ryerson stocks for 2221 different kinds, shapes and sizes of stainless steel. And Ryerson stocks of carbon and alloy steels are just as large and diversified. So for stainless that solves welding problems—and every other steel requirement, call your nearby Ryerson plant.

RYERSON STEEL

In stock: Bars structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Metalworking Outlook

Concessions Extended?

Look for the United Auto Workers to offer concessions to Studebaker-Packard Corp. and Kaiser Motors Corp. similar to those in the American Motors Corp. agreement. AMC signed up for a Supplemental Unemployment Pay plan but won't have to contribute 5 cents an hour per worker until Sept. 15, 1956, and won't have to pay benefits until the same day in 1957. The Packard contract runs out Sept. 30. Last week, Studebaker workers were out on a wildcat strike, one of a series that have plagued that division this year. The Kaiser contract expired last June 1, but was extended "indefinitely."

The Big Fringe

Steelworkers' fringe benefits cost 50 cents per hour per worker and account for 17.5 per cent of the average steel company's total labor bill. So says J. L. Mauthe, president of Youngstown Sheet & Tube Co., who adds: "If the steel industry is to continue to prosper and expand, the price paid for our product must reflect all the increased cost of doing business, including fringe benefits."

Wage Settlements Rise

Wage settlements negotiated this year in the Cleveland area (considered a good barometer because of its industrial diversity) average 8.64 cents per hour. In figures compiled by Associated Industries of Cleveland, the effect of the steel and auto settlements are clearly seen. In contracts negotiated before June 1, the average was 6.37 cents; in contracts negotiated after June 1, the average jumps to 9.41 cents.

Unfair Unions?

Individual workers in fiscal 1954 filed charges of unfair practices in 2147 cases, the highest in the National Labor Relations Board's 19-year history and about 5 per cent above the previous peak set in 1949. Significantly, two out of five of those charges were against unions, not employers.

Canadian Investments Up

American investments in Canada are increasing at the rate of $700 million a year. At the end of 1954, U.S. direct investments totaled $6 billion—$2 billion in manufacturing, $2 billion in oil and the rest in miscellaneous categories, including mining.

U.S. Firms vs. Canadian

The 100 largest U.S. corporations, according to the First National City Bank of New York, pay out 92.6 per cent of money received as costs of

doing business, keep 3.2 per cent in the business and distribute 4.2 per cent as dividends. A survey of 1100 Canadian companies by the Canadian Manufacturers' Association reveals that they pay out 94.8 per cent as a cost of doing business, retain 2.8 per cent and pay out 2.4 per cent in dividends.

Coming: Antimerger Drive

Watch for the Federal Trade Commission to launch a new drive to block mergers held in violation of Section 7 of the Clayton act. The commission is particularly concerned with finding methods to deal with "conglomerate" mergers—those involving corporations making different products. Another problem troubling FTC is what to do about unscrambling the assets of corporations which have already merged, but illegally so.

Decision on Aluminum

The Office of Defense Mobilization will announce in the next week or two its new policy on aluminum expansion and stockpiling. The expansion program, if any, will be made the responsibility of industry. There's little chance of guaranteed loan agreements or any other device to induce expansion; government contracts calling for production of high-cost aluminum at Massena, N. Y., and Baden, N. C., will not be renewed. Regarding stockpiling, ODM Director Arthur Flemming is expected to insist on a token payment of about 20 million lb of aluminum. His thinking: Producers must be reminded of their obligation to the stockpile. However, the payment will be nothing more than a token since the government has no intention of making the tight supply any tighter.

Ordnance Tells What It Wants

Sample rooms have been set up by the Ordnance Corps at Oakland, Calif., Portland, Oreg., and Seattle to facilitate participation by small business in defense production on the West Coast. Coupled with 50 or more common items of ordnance procurement on display are hundreds of invitations to bid received from Army arsenals, depots and centers throughout the U.S.

Straws in the Wind

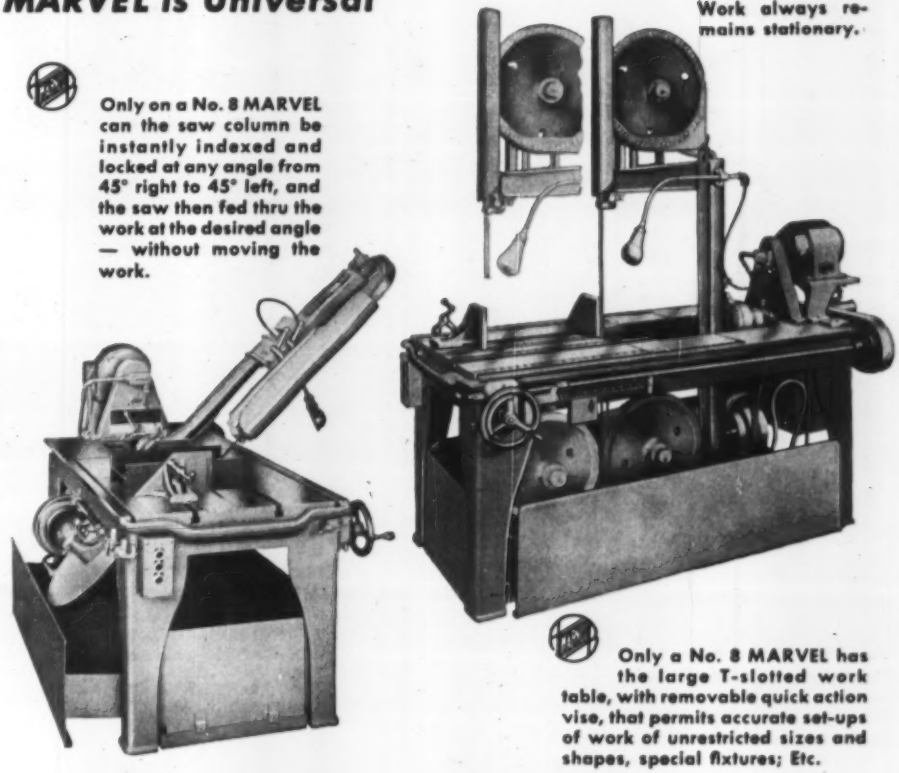
The Administration is studying a proposal to cut defense spending by $1.7 billion to balance the budget by next summer; the Air Force would be cut $750 million, which would mean reduced aircraft procurement . . . The Securities & Exchange Commission expects to finish by Sept. 30 a comprehensive survey of pension trust plans and how well they are working . . . The Federal Power Commission in the 12 months ended June 30 authorized construction of 4900 miles of natural gas pipeline and 260,000 horsepower in compressor capacity . . . Sharon Steel Corp. broke ground at its Roemer Works last week on a 44-in. blooming mill to cost $13.5 million . . . The American steel industry shipped 48,240,756 tons of steel in the first seven months, with record tonnages going to the automotive, container and construction industries.

Never Confuse the No. 8 MARVEL with an ordinary Band Saw

...only the MARVEL is Universal

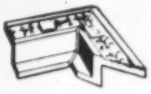
Only on a MARVEL No. 8 does the blade remain at a right angle throughout its full 18" feed traverse. Work always remains stationary.

Only on a No. 8 MARVEL can the saw column be instantly indexed and locked at any angle from 45° right to 45° left, and the saw then fed thru the work at the desired angle — without moving the work.



Only a No. 8 MARVEL can do all of these things: Snip-off a ½" rod or cut-off an 18" x 18" cross section

Rough to Size and Shape



Miter

Index

cut off and shape Structural Beams.

Only a No. 8 MARVEL has the large T-slotted work table, with removable quick action vise, that permits accurate set-ups of work of unrestricted sizes and shapes, special fixtures; Etc.

"Rough Machine" to size and shape with minimun chip waste

The No. 8 MARVEL is the "busiest tool in the shop" wherever installed because it is a *universal* tool—has both the capacity and the versatility to handle not only standard sawing jobs but innumerable "trick" and convenience jobs as well. More than a metal saw, the No. 8 MARVEL is a fine machine tool with machine tool features like: Both power and hand feeds; Depth Stops; Automatic Blade Tension; Built-in Coolant Pump; Three operating speeds (or six with 2-speed motor). Moisture-proof electrical controls that conform to both "J.I.C." and "MACHINE TOOL" electrical standards; Dirt-proof ball bearings, etc.

If you cut, machine or fabricate metal, this is a sawing machine you should know about. Write for catalog.

MARVEL Metal Cutting SAWS

Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO. • 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

Twice the life of materials previously used is reported for this group of Ni-Vee bronze half bearing castings used in the first six or eight rolls each side of rollout table on large reversing mills. Ni-Vee type bronze castings are used for various heavy duty steel mill maintenance jobs. Castings shown on this page were produced by A. W. Cadman Manufacturing Company, Pittsburgh, Pa. under their trade name "NICUITE."

NI-VEE bronzes double life of parts in rollout tables and other mill machines

STRENGTH UP TO 90,000 psi and high resistance to wear, impact and galling characterize Ni-Vee bronzes.

Other advantages include easy castability, low shrinkage, pressure tightness, fine grain, economy and versatility.

Containing 5 per cent nickel and 5 per cent tin, Ni-Vee bronzes increase life of gears, cams and similar "constructional" castings. Likewise, the life of "pressure" group castings such as pumps, valves and fittings.

And for bearings, bushings and anti-friction metal, leaded Ni-Vee bronzes process into hard, wear-resistant products that are unmatched by the usual lead-free compositions.

Ni-Vee bronzes are produced by authorized foundries in industrial areas from coast to coast.

Get the facts about nickel-tin bronzes and see how they can save you money. Write now for the valuable data-packed booklets entitled, "THE NI-VEE BRONZES." They are yours for the asking.

Four times life of replaced tin bronze and still good. That's the status of Ni-Vee bronze feed screw nuts cast by A. W. Cadman Mfg. Co., for Babcock & Wilcox, Barberton, Ohio.

2,000,000 tons of steel were rolled by a 40" blooming mill, before its Ni-Vee bronze screw box nuts . . . such as the one shown above . . . called for replacement.

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N. Y.

No Trojan Horse

Is the Western World rearing a new and powerful Trojan horse?

That's the question raised by the rebirth and rearming of the Federal Republic of Germany.

Only ten years ago, the Wehrmacht was forced into unconditional surrender after bombing had smashed German cities and industry flat, and Allied troops had overrun the country.

After the surrender, East Prussia was divided between Russia and Poland. The territory east of the Oder-Neisse with industrial Silesia went to Poland. The Russian occupied zone just east of the Oder-Neisse became a puppet communist state, with Western Berlin isolated in the middle. The Saar, with its coal and steel, went to France.

The three zones occupied by the United States, France and Britain became the independent Federal Republic. Its industrial Ruhr is cut off from its prewar markets to the East. So is the great industrial complex at Salgitter, a dozen miles from the Iron Curtain. Hamburg no longer is the port of entry for Middle Europe. Ten million expellees and refugees fled into already-crowded Western Germany.

Encouraged with U. S. aid, the irrepressible Germans have gone to work. Bomb rubble has been bulldozed aside to make way for new plants, new streets and new housing. Industrial production has more than tripled in seven years. Foreign trade is back to $11 billion, with the balance in favor of Germany. There are over 16 million wage and salary workers. Unemployment is less than 1 million. Shipbuilding is second only to Britain's. Being formed is a new half-million-man military force, including an air arm and a small navy.

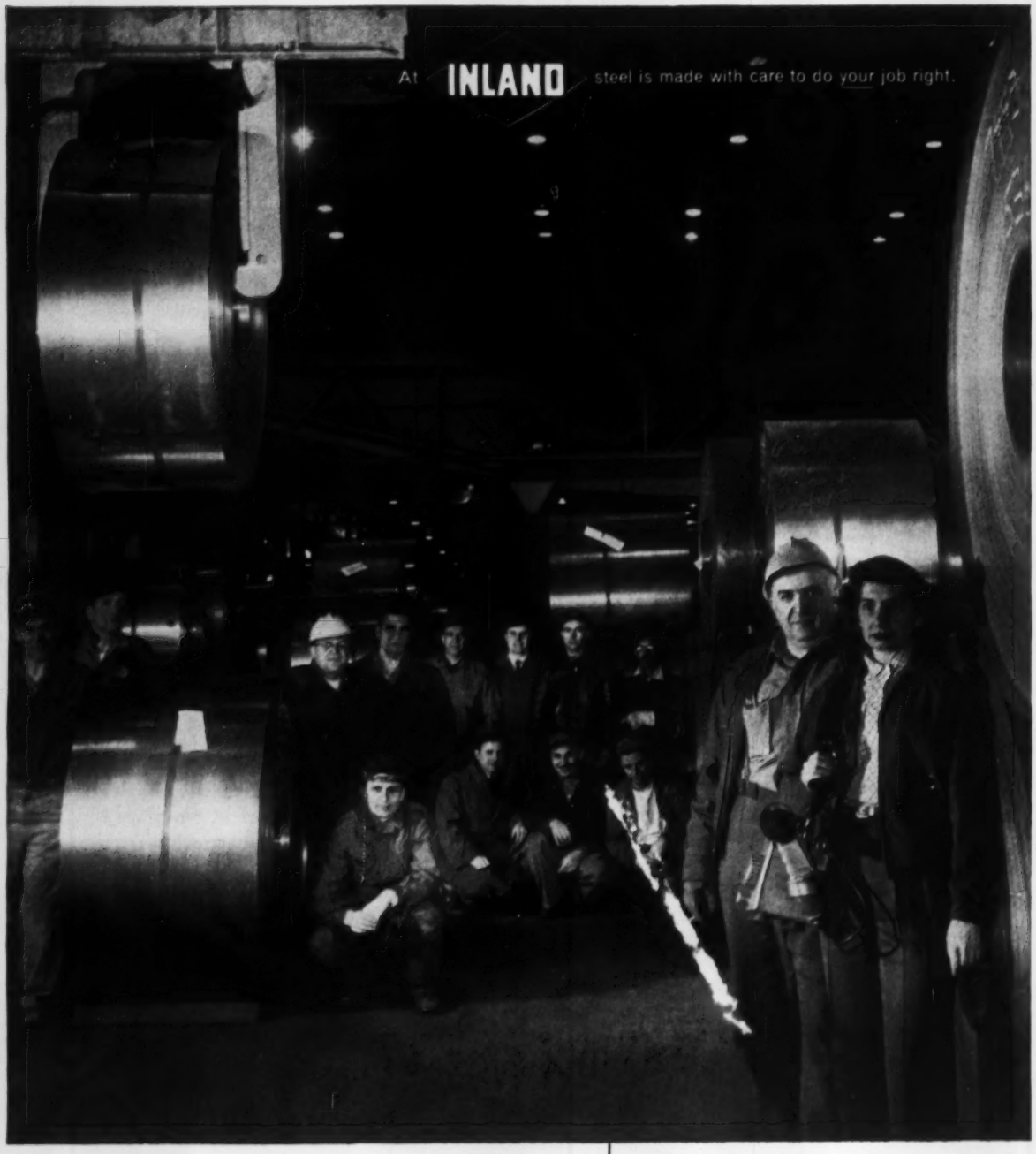
The stage appears to be set for Germany to repeat the performance of post World War I when Hitler rose to power, but the setting is different now.

After the first war, German borders were left largely intact. There was less destruction. Her people did not suffer total defeat. She was left largely to her own devices.

This time, Germany is integrated with other Western nations. A combined military force will stand guard against the communists. Germany's present strong democratic leaders lean strongly toward the West. And the Steel and Coal Community cutting across international tariff walls could be the basis for a broader economic union.

Irwin H. Such

EDITOR



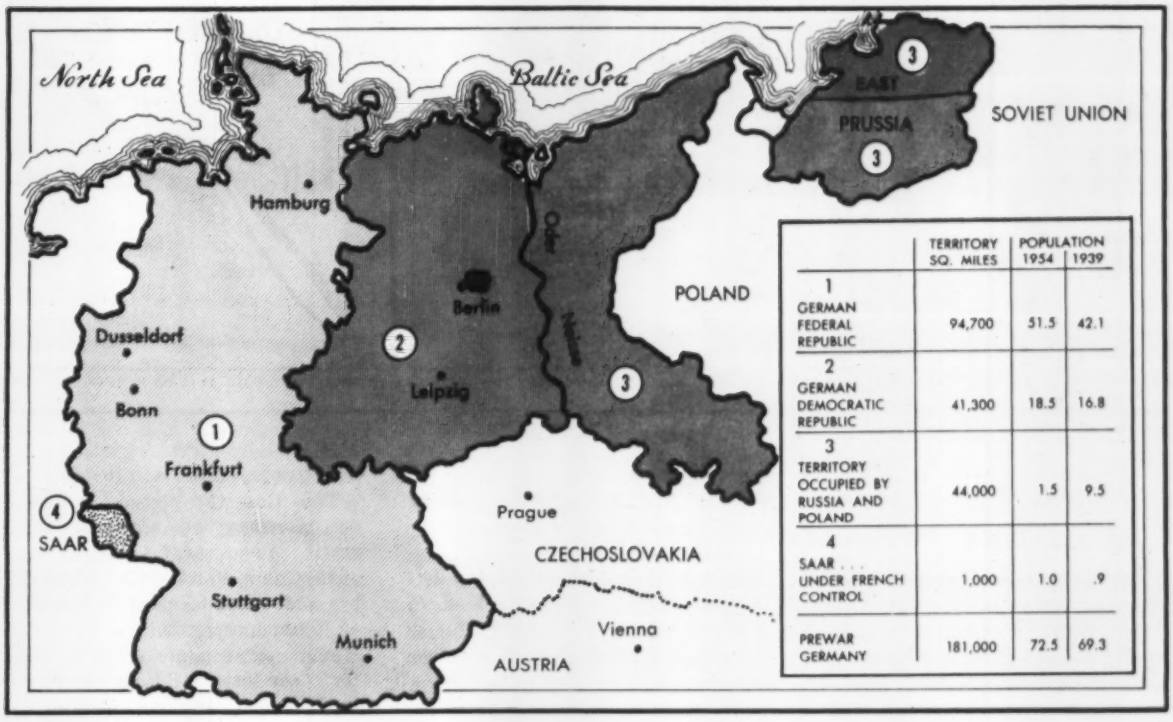
THESE INLAND PEOPLE CAN TELL US "NO" (AND FREQUENTLY DO)

The power of veto is delegated to many people at Inland, any one of whom can turn thumbs down on our steel, somewhere along the line, if it isn't right for your job. Take cold rolled sheets, for example. Inland encourages this negative attitude on the part of the individuals in this photo, who are concerned with quality control at various stages of steel production. Their vigilance assures you of uniformly good quality steel, order after order, year after year.

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul Davenport • St. Louis • Kansas City • Indianapolis Detroit • New York

Principal Products: Sheets • Strip • Structural Shapes • Plates • Bars • Tin Mill Products • Rails and Track Accessories • Coal Chemicals



	TERRITORY SQ. MILES	POPULATION 1954	POPULATION 1939
1 GERMAN FEDERAL REPUBLIC	94,700	51.5	42.1
2 GERMAN DEMOCRATIC REPUBLIC	41,300	18.5	16.8
3 TERRITORY OCCUPIED BY RUSSIA AND POLAND	44,000	1.5	9.5
4 SAAR . . . UNDER FRENCH CONTROL	1,000	1.0	.9
PREWAR GERMANY	181,000	72.5	69.3

Report on Europe: Back from a six-week tour of West Europe, *STEEL's* editor, Irwin H. Such, reports his findings in this and succeeding articles.

West Germany Comes Back

TAKE any hour from dawn to late evening in any city in the Federal Republic of Germany . . . from Munich in the south to Hamburg in the north or beleaguered Western Berlin in the Soviet zone.

The pattern is the same: People with briefcases in hand are hustling to their work, business appointments, shops or classrooms.

It's just one bit of evidence of the relentless determination of the German people to bring their country back to full stature in the community of nations.

Politically, Germany again is flexing her muscles as an independent nation.

Economically, she has leaped ahead of many other nations, including some of her enemies of World War II.

What It Means—The implications for America and the American metalworking industry specifically are complex and manifold.

In a nutshell, Germany is tying herself more closely to the United States than to any other country. In turn, of necessity the U. S. will find herself closely tied to Germany for many years to come.

This strong affiliation started when invading American troops gave chewing gum and candy to German children. It was strengthened when the U. S. induced her allies to call off the dismantling of German plants. It was fostered by an ingrained suspicion of the French and to a lesser extent of the British.

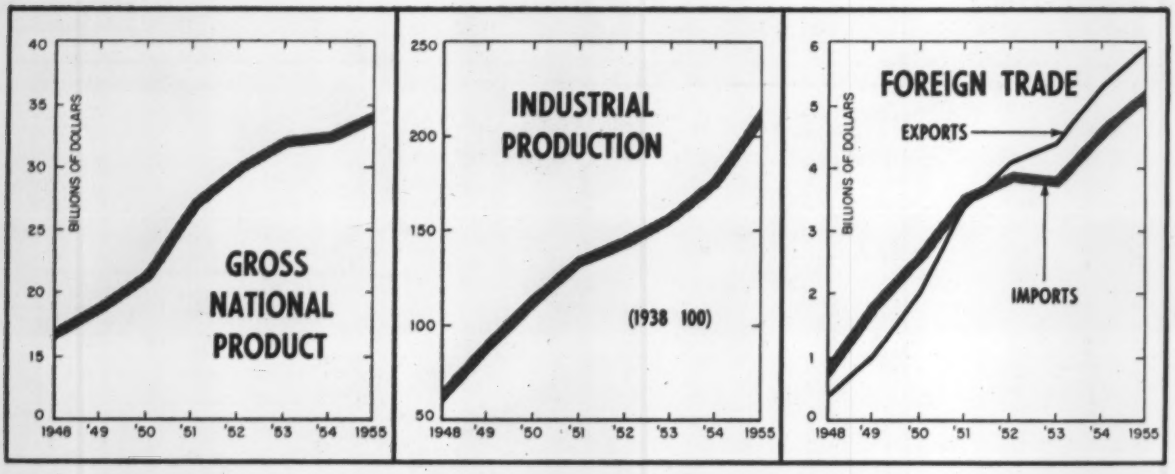
Americanized — There's another often overlooked angle. By nature, the Germans like the aggressiveness and ingenuity of Americans. Many take pride in the fact that Germany in a sense is being Americanized. German housewives, for example, can step into any one of several hundred American-type supermarkets and buy goods packaged with automatic machinery. In neighboring countries, housewives still must wander from store to store for each item.

Rising young German executives are going all out for American management methods. For them, bowing and scraping and Prussian heel clicking are taboo.

Trade — Germans and Americans, individually and as teams, are beating their way back and forth across the Atlantic. They're selling each other goods and equipment, establishing branch plants, setting up licensing arrangements or exchanging management and manufacturing know-how.

Several U. S. consulates in Germany are moving into large, new buildings with well-trained staffs to help American businessmen abroad. The Federal Republic is sending competent people to this country to man an expanding consular service.

The Republic—Before the war, Hitler's Germany had a population



of 69 million living on 181,000 square miles of territory stretching across the north and north central face of Europe.

At the historic Potsdam Conference in 1945, areas east of the Oder-Neisse rivers were handed to Russia and Poland. The balance was divided for administration by the U. S., Great Britain, France and Russia.

By 1946 it became evident that the Soviets could not get along with the Western powers. On Sept. 21, 1949, the three Western powers recognized their sectors as the Federal Republic of Germany. Russia countered on Oct. 7 by setting up her sector as the German Democratic Republic.

Unification—In the conversations this month between Chancellor Konrad Adenauer and the Soviets, unification will be a principal topic.

On the surface, the Bonn Government appears anxious for unification with Eastern Germany. Underneath, sentiment for unification is none too strong, especially among business people and many a man in the street. Most Germans recall vividly the miseries of the forties and dread the economic setback the absorption of the depressed eastern areas would bring.

If the Soviets hold out the bait of more trade to the East, it will look tempting but perhaps not tempting enough. Other markets to the West have been found for German industrial products.

There's no doubt that the Germans will insist on the recovery of the territories east of the Oder-Neisse since they include the Silesia with its important mining and industrial resources.

Don't write off unification completely. Securities of communist-controlled companies in Eastern Germany have been going up in unofficial trading west of the Iron Curtain.

The People—When the European Defense Community was established in 1952, the Russians ripped up a strip of land 10 meters wide on their side of the border. Back of this is a completely depopulated zone 500 meters wide, then a cordoned zone 5 kilometers deep. This Iron Curtain has been effective in curbing the broadside movement of refugees to Western Germany but not the pinhole leak via Western Berlin.

In all, the Republic has had the problem of absorbing 10 million refugees and Germanic people expelled by the Soviets prior to 1952.

In reality, these people have contributed to the recovery of the economy because of their skills and willingness to work long hours on difficult jobs at low pay. Whole industries, such as the costume jewelry trade, were transplanted from the East to the West.

The Government—After World War I, the Allies exacted heavy reparations from Germany, but her borders were left largely intact, and there was comparatively little war damage. But the weak Weimar Republic, ravaged economically by the violent currency inflation of the twenties, fell to the onslaught of Hitler's National Socialists after the Allied occupation troops pulled out in 1930.

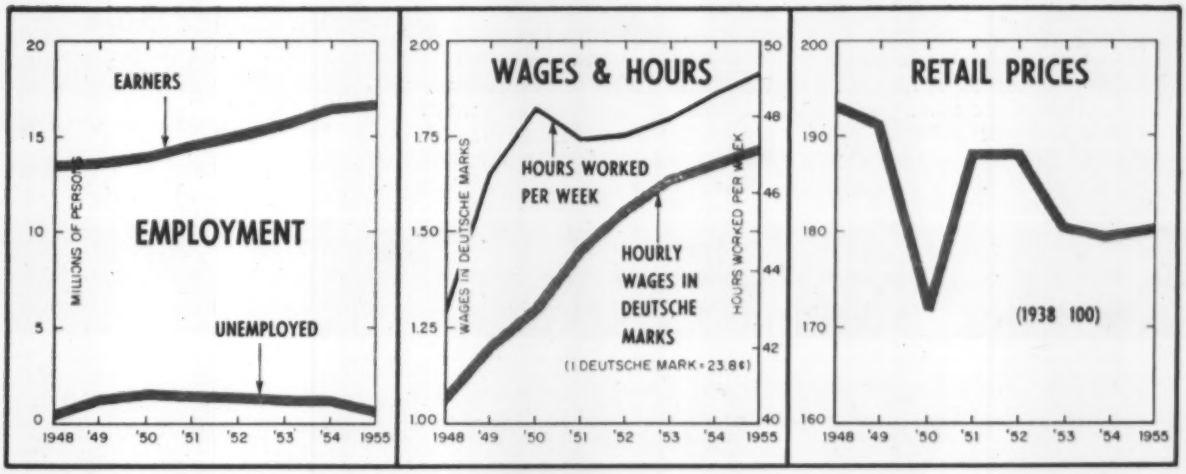
This time the picture is different. Germany has a strong democratic government. Aging but virile Chancellor Konrad Adenauer has able backstoppers in Minister of Economics Ludwig Erhard and Minister of Finance Fritz Schaeffer. The latter held a similar post in the Bavarian government before the Nazis dismissed him in 1933. He has proved adept at managing the federal budget and maintaining the German mark as one of the soundest currencies in the world.

Adenauer's party, the Christian Democrats, has an excellent chance of staying in power in an increasingly prosperous economy. The Communists have been able to round up only a handful of votes.

U. S. of Europe—Binding Germany to the West is the growing concept of a community of western nations with an international parliament and members of a lower house named in popular elections. A Council of Europe with committee of ministers of 14 member states and a consultive assembly of 130 already exerts great influence on the actions of its members.

The council aided in the establishment of the European Defense Community and the European Community for Coal and Steel. These two groups, which cut across political and economic boundaries, could form the basis for a larger organization.

War Effects—The war and the dismantling program reduced the industrial capacity of the Federal government territory by 20 per



cent. Many plants were completely destroyed or equipment entirely removed.

The allies banned the production of armaments, heavy tractors and chemicals. Steel production was set at 5.8 million tons a year, or 25 per cent of prewar. Limits were placed on machine tools, autos and trucks.

Shipbuilding was practically banned. Shipyards and docks were wrecked. Railroads lost a large part of their rolling stock. Many large companies were split into smaller units. Manufacturing plants often were divested of their raw material sources.

Currency Reform — The years 1945 and 1946 were pretty grim for German industry and for the German people. There was some recovery in 1947, but the real turning point came with the currency reform of June 20, 1948, and the advent of Marshall Plan aid.

Overnight, 170 billion in Reichsmarks shrunk to 10 billion worth of new Deutsche marks, following establishment of the Bank Deutsche Laender, patterned after the American federal reserve system.

Many a German plant still likes to keep a Marshall Plan sign over its door as a reminder of the badly needed assistance it got from the U. S. Financial aid from the Marshall Plan and other funds amounts to about $3.5 billion.

Recovery—Germany's total production of goods and services (gross national product) will be $34 billion this year or double that of 1948. Industrial production is more than three times greater and double the prewar level.

Exports — German economists believe that improvement in the standard of living at home is dependent on a thriving export market. High-powered export departments maintained by every important company, plus export subsidies, have paid off in a favorable balance of trade for the last four years. Many companies figure on doing 40 to 50 per cent or more of their business abroad.

Employment—Germany has 16.5 million wage and salary earners. Unemployment is less than three quarters of a million. Working hours average more than 49 a week. So German shipyards, for example, can make better deliveries than those in Britain which are on a shorter work week. Many orders have been switched to German yards.

Wages and Prices—The average German industrial worker receives about 40 cents an hour—a rate slightly higher than France's, lower than Britain's and less than 25 per cent of America's.

Chancellor Adenauer is paid

WESTERN GERMANY'S rebirth has brought about distrust and uneasiness abroad, and no man is more aware of this than Dr. Ludwig Erhard, federal minister of economic affairs.

What other nations are thinking stems from his aggressive economic policies—policies which have contributed so much to the republic's well-being. As an offset, he works at creating good will on tours abroad and statements like this:

"The German people only have a chance of existence and a future, if they can join up—especially as regards economic questions—closely with other nations and other economies."

Dr. Erhard beats the drums constantly for free convertibility of currencies to promote more trade. He thinks that industrialization of Latin America and the Near and Middle East will promote a freer exchange of goods.

While pushing for more business abroad, he realizes that trade can't be a one-way street. Import procedures have been simplified and duties lowered on several hundred products. Export subsidies are due for an overhaul at the end of this year.

Dr. Erhard, born Feb. 4, 1897, in Fuerth, Bavaria, studied at Nuremberg and also under the famous sociologist, Franz Oppenheimer, at Frankfurt. He was awarded a doctor's degree in political science, then turned to economics. During the Nazi regime, he engaged in industrial and market research at Nuremberg.

After the war, he became minister of economics in Bavaria. In 1949, while serving with the Bizonal Administration in Frankfurt, he was elected to the Bundestag at Bonn by the Christian Democrats. Later, he was appointed Minister.

He's most often mentioned as the logical successor to Chancellor Adenauer.

$10,700 a year and $5500 for expenses; cabinet members get $8500, plus $2550 for expenses. Top industry executives do a little better. Most white-collar workers get less than the $1000 a year earned by hourly workers. Only about 2 per cent of the population earns over $2000 a year.

Fortunately, retail prices are 7 per cent lower than they were in 1948 and have held steady for the last three years. German workers also get more social benefits than American workers in the form of low-cost housing, inplant meals, etc., which don't show up in comparative statistics.

Republic Steel To Expand

The nation's third-largest producer will boost its capacity 16 per cent. It believes that a number of the new facilities will be utilized as soon as they're completed

REPUBLIC STEEL Corp. is launching the largest expansion program in its history. A total of 1.6 million tons of new steel ingot capacity will be added to the firm's present capacity of 10.3 million tons.

The expansion (see STEEL, Sept. 5, p. 41) will represent an investment of more than $130 million and will be added to Republic's basic steel plants in Cleveland, Warren and Youngstown, O., Chicago, and Gadsden, Ala.

What Kind? — There will be some new open hearth and electric furnace capacity, but most of the new ingot expansion will come from increasing the size of present production facilities. C. M. White, president, reports that a careful survey indicates that by expanding these facilities, the cost of the increased tonnage will be only $80 per ton. To build completely new capacity would require an investment of some $300 per ton.

It is expected that the expansion will bring substantial operating savings as new and currently operating facilities are carefully meshed. New finishing mills will be needed to convert the additional ingot tonnage into products, and it is anticipated that expansion programs will get under way in the mills producing hot and cold-rolled sheets and strip, electrical sheets and strip and bars and wire.

Interesting Point—No new blast furnaces will be built. The company's 22 furnaces will be able to supply the new steel facilities through increased use of taconite pellets and high-quality Labrador ore. The advantage of high pressure blowing also will be utilized. "This combination," says Mr. White, "has already increased the efficiency of the blast furnaces and has enabled us to produce substantially more iron."

Cost of the expansion program will be paid for by depreciation, amortization and retained earnings. To assist, if necessary, Republic has reached an agreement with a group of the largest U. S. commercial banking houses for a five-year revolving credit of $75 million at the prime interest rate in effect at the time. Republic will have an option which will allow it to convert the revolving credit into a five-year loan at the end of the credit period.

Key to Progress—During 1954 and 1955, the balance of Republic's debentures ($55.4 million) were converted into common stock. The prior preference stock also was converted into common stock. As of Aug. 31, 1955, Republic's long-term debt was $45.9 million, while working capital soared to $240 million.

"As a result," Mr. White states, "Republic is in the best financial position in its history to undertake a major expansion program. Today, we can step out and undertake projects which we only dared dream about less than ten years ago. To the gloomy prophets of a year ago who saw nothing but recession, I can only suggest a look to the future for the brightest tomorrow this nation has ever known. The 1.6 million ton expansion program is the strongest vote of confidence we can give to the future."

Savings for Sale

Cost cutting, labor saving are twin themes of Machine Tool Show. Big crowds see opening

MORE than 8000 metalworking executives jammed Chicago's International Amphitheatre on the opening day of the Machine Tool Show last Tuesday.

Budget—Bargaining for efficient use of time, visitors never became show tourists; they studied, probed and asked about only those machines that might be practical and profitable in their plants.

Biggest crowds surrounded the souped-up, more flexible general-purpose machines.

Ceramics—Many machines run at speeds impossible on older models. Two exhibitors have machines turning with ceramic-tipped cutters. One is turning 1020 steel at more than 2000 sfpm.

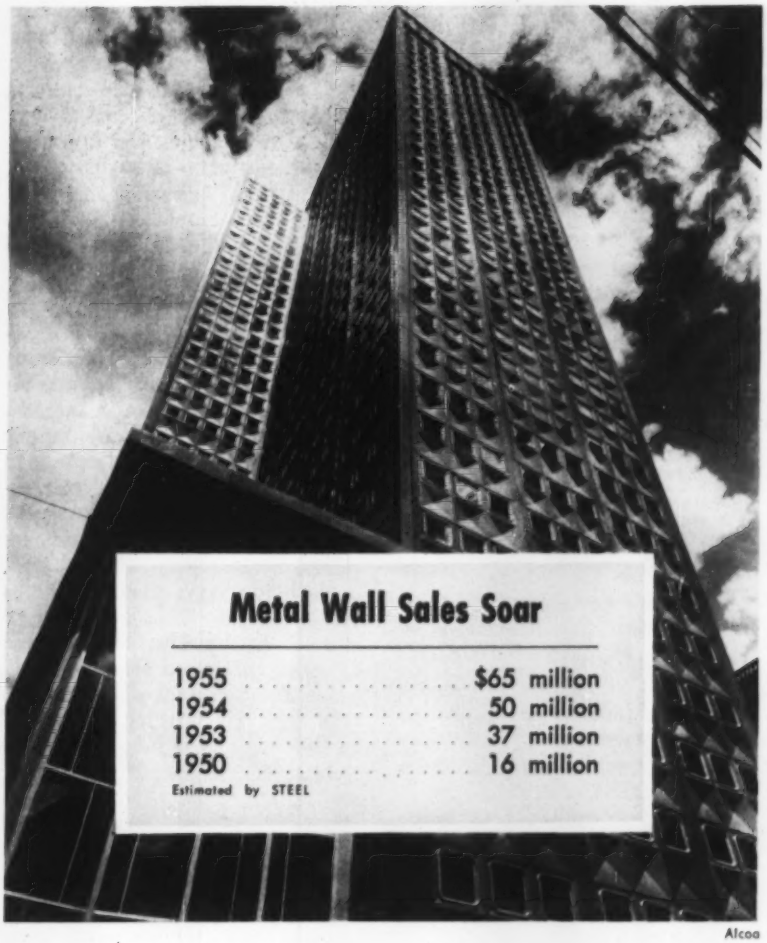
Other booths simply display the ceramic tools; attendants are speculating on what is in store for the new material as it makes the jump from the laboratory to the production line.

Common Denominator—If there is any single trend that shows up most important in the hundreds of display machines, it is the obvious effort on the part of equipment builders to make the machine operators' working hours more productive by making them less strenuous.

New models of standard machines have buttons and switches to do what used to be done with a tug and a shove of a lever and crank. One lathe features a panel of switches that completely controls cycle setup.

Variety—Every possible machining operation is being performed at the show, from standard forming and cutting to the recent ultrasonic and electrodischarge techniques.

The Machine Tool Show is a challenge to the visitor. To benefit, he must size up display models in terms of his own operation. First-day show goers were using this approach on a large scale. As soon as they begin to put the new ideas to work in their plants, the builder's battle for the replacement market will be almost won.



Alcoa

Towering growth of curtain wall sales promises . . .

New Market for Stampers

METAL curtain wall and wall panel sales have enjoyed an explosive growth since 1950. Business has almost quadrupled (see table).

Some 60 companies are handling the fabricating job. Porcelain enamel has the largest share of the business; aluminum runs second; stainless is third. Estimated volume this year: $60 million.

Big Business—Hundreds of metalworking companies making fasteners, trim and other specialties back up the prime panel men. Often, architects specify detail work that panel makers can't handle economically. Davidson Enamel Products, Lima, O., a porcelain enamel shop, is among many panel people that sublet such work. Suggestion for smaller stampers: Check the companies handling local buildings, offer to take special work off their shoulders.

Commercial Shearing & Stamping Co., Youngstown, illustrates that it can be fairly easy for a larger stamper to break in. Before the New York Socony-Mobil building contracts were let, it had never done curtain wall work. With some additional equipment, it landed one of the biggest contracts on record. Basic tools: Press brake and shear, welding equipment, stamping or roll forming press. Most jobs can be handled on 10-ft equipment.

Tools—Equipment for porcelain enamel work is more complex. Elmer Dany, executive vice president of Ferro Corp., Cleveland equipment buider, estimates that a porcelain enamel shop making kitchen cabinets, for example, would have to spend about $18,000 for an automatic spraying machine and dryer. To enamel on aluminum, a convection furnace is needed. A batch-type unit costs about $30,000; a continuous furnace, about $100,000.

Most successful curtain-wall fabricators have three things in common. Working capital of at least $500,000, specialized technical knowledge and specialized sales forces. Building trade complexities are the reason.

Panel makers may have to carry job costs for as long as a year while payment filters down through many levels of contractors. Engineering departments must be able to work to exacting specifications with architects and materials suppliers. Sometimes, panel makers are required to erect their own panels. H. H. Robertson Co., Pittsburgh fabricator of stainless steel panels, assembles work on the job, using trained crews. It's cheaper, but it requires an organization beyond the means of many smaller shops.

Pooled Skills — But new companies are flocking into the field. They can count on plenty of help from materials suppliers. Suppliers keep close tabs on designers and fabricators and work with them and the architect to specify alloys, tempers and finishes.

The American Iron & Steel Institute, The Porcelain Enamel Institute and other industry groups have active programs for clearing up problems of building code specifications and technical questions.

Payoff — Most manufacturers won't put a limit on growth potential. Ingram-Richardson Manufacturing Co., Beaver Falls, Pa., says its volume tripled from 1953 to 1954, will double again this year. A big future is seen in smaller office buildings, hospitals, schools.

Makers point to these advantages: Curtain wall is light, colorful, a good insulator, saves floor space and cuts down on maintenance costs. Most important, it's the fastest known method of covering a building's bones.

Underground storage and expanding markets help . . .

LP-Gas Sales Gain 10%

LIQUEFIED PETROLEUM GAS sales have doubled in the past six years (from 2.8 billion gallons in 1949 to an estimated 5.6 billion gallons in 1955). During this period, the number of consumers has jumped from 5.5 to 9 million.

This year's totals will bring a sales increase of some 10 per cent over last year's. This trend will continue for at least five more years, say industry spokesmen.

Increased Costs—LP-gas distributors are concerned with the rising cost of tank cars and storage units. There is a solution: Underground reservoirs.

Salt formation cavities are being used successfully at a cost of less than $1 a barrel. Other types of geological formations also can be utilized. Means have been found to effectively seal them at a cost of less than $5 a barrel.

Phillips Petroleum Co. reports that at the first of the year 458.4 million gallons of underground storage for LP-gas had been developed and that of this total 83 per cent is stored in salt formation cavities. It is estimated that of 249.9 million gallons of new underground storage being proposed or under construction, 90 per cent will be in salt cavities.

Sales Feature—Low distribution cost is the key to the future growth of LP-gas sales. This fuel is less expensive than coal and electricity in many geographical areas, and it is cleaner than fuel oil. Where natural gas is available, it usually is 20 to 50 per cent cheaper than LP-gas.

There is a bright spot for metalworking. Increased use of LP-gas will call for more steel and nonferrous metals for valves, fittings, etc. The LP-gas industry also is moving toward the realization of a dream—a Big-Inch steel pipeline for liquid propane.

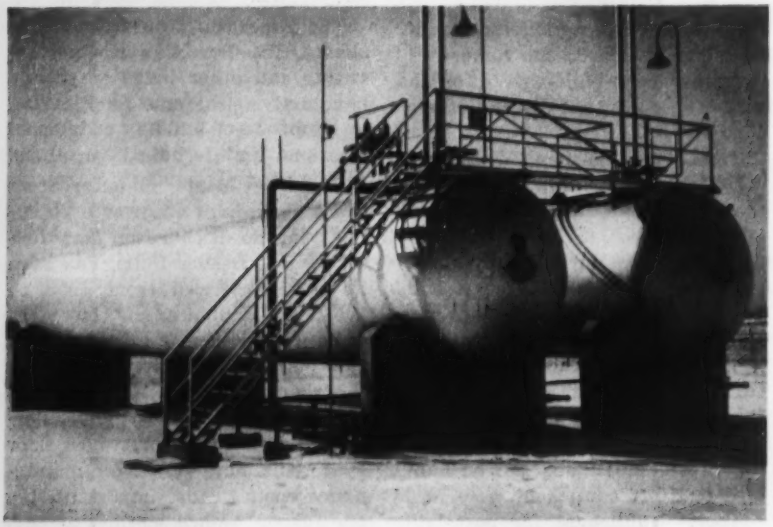
Growing Uses—Fastest growth is being recorded in the use of LP-gas for internal combustion engines. Farm tractors continue to be the largest consumer of motor fuel. At the end of last year, it was estimated that some 200,000 tractors were running on propane, a gain of 40,000 in one year. Major tractor makers are able to deliver their units equipped for this fuel.

Transit companies, operating busses on LP-gas, have increased some 17 per cent in a year. It is expected that 2100 LP-gas operated busses will be in service by the end of 1955. Another growing use for this fuel is in plants where controlled temperatures are used.

Heating and household uses, classified as domestic and commercial, accounted for 51.3 per cent of all sales in '54. Second largest user was chemical, 20.5 per cent; third, internal combustion with 10.7 per cent.

New Markets—Air conditioning promises to boost sales. LP-gas for use in fork lift trucks is increasing in popularity, too. As LP-gas burns cleanly and completely with a minimum of fumes and odor, internal combustion engine trucks can be operated with maximum safety.

Sidelight: Advocates of LP-gas point out that in last spring's atomic test, Operation Cue, the LP-gas installation stood up well. Indications are that an atomic attack will not interfere with LP-gas service unless the entire plant (which the LP-gas services) is demolished.



LP-gas "peak shaving" installation serves industry

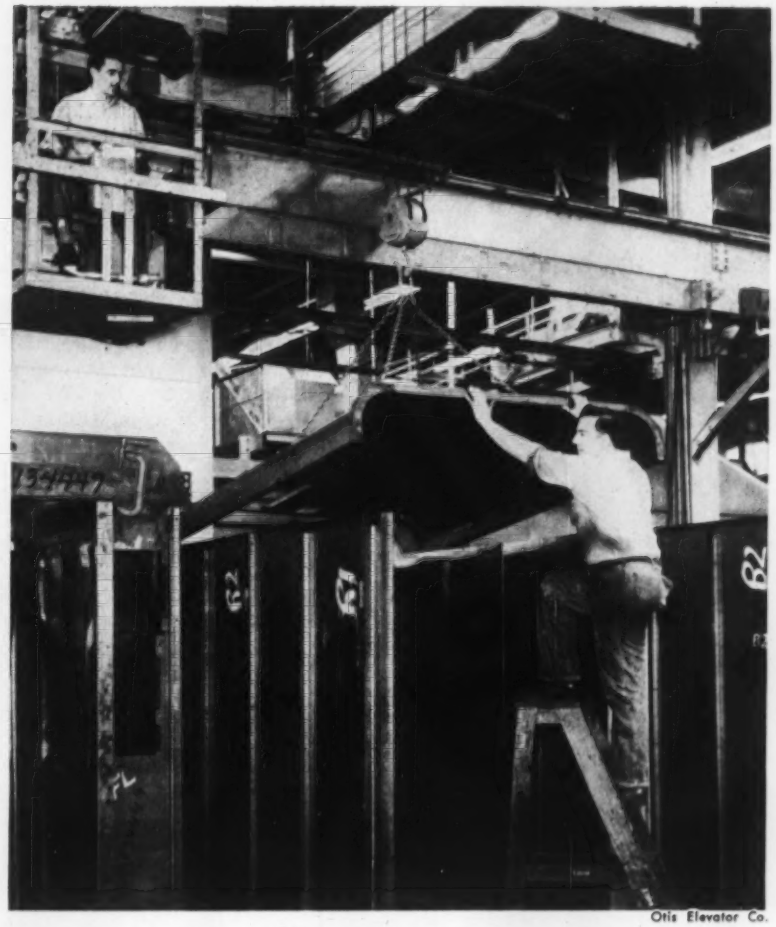
Steel Wages Jump in July

Hourly wages of iron and steel workers jumped 17.8 cents to a July record of $2.598.

According to the American Iron & Steel Institute, these wages were paid to 676,400 employees in the production and marketing end of the industry. An additional 20 cents an hour (estimated) went for pensions, social security and insurance. The June wage averaged $2.42 per hour for 667,100 workers.

Vacations cut the average work week from 40 to 35 hours, but were not responsible for the $1.6 million drop in total payrolls. Vacation pay for wage and salaried employees is uniformly allocated to each of the 12 months of the calendar year for statistical purposes. Result: An apparent payroll reduction for July from $298.4 to $296.8 million.

Institute data are based on reports from 102 companies representing approximately 96.2 per cent of blast furnace capacity and 94.9 per cent of the 1955 steelmaking capacity of the industry.



Otis Elevator Co.

There is plenty of metalworking work to be done with . . .

Elevator Sales Going Up

ELEVATOR MANUFACTURERS are geared for an all-time record production year. In this up-and-down business, the accent is on the up.

This industry, composed of about 200 companies, owes much of its current sales spurt to the omnipresent construction boom. New sales this year will be $100 million to $125 million, topping the previous record set in 1950. But of greater importance is the modernization market, which will be even larger.

Kingpins—The two leaders in the business are Otis Elevator Co., New York, which produces about 50 per cent of the industry's dollar volume, and the Elevator Division of Westinghouse Electric Corp., Jersey City, N. J., which produces about half of the remainder. However, both insist their strongest competition comes from the many smaller companies in the business.

There are about 60 companies in the U. S. which manufacture some major components of the freight and passenger elevators they sell. That leaves about 140 which are basically service companies who get the yen once in a while to sell new equipment. These firms seldom design the installation. They merely buy parts and assemble a machine which meets the builder's specifications. They can beat the major producers' prices because their overhead is low.

Much Metalworking—There are as many as 28,000 parts in one of the machines. Few companies make all of their own components. They buy parts from other elevator companies or from suppliers who specialize in electrical equipment, brakes, doors, etc.

Depending on the particular model, an elevator, exclusive of cable, will be between 40 and 60 per cent carbon steel by weight, about 5 per cent copper, 1 to 2 per cent each for stainless and aluminum, with a large part of the remainder cast iron. In addition, the average installation in a ten-story building requires over 500 ft of ½-in. to ⅝-in. traction steel cable.

Blessed Assurance—One of the most important developments over the past five years has been the completely automatic, electronic, passenger-operated elevator system for use in intensive traffic situations. For the first time, a major elevator development gives the building owner not only a better system, but also a chance at hefty savings. Surveys indicate the average annual cost of an elevator operator is between $5500 and $7000. An automatic elevator will cost about 10 per cent more than the older type, but that can be written off in the first or second year by eliminating the operator. Thereafter, the cost can be amortized from these savings in about 10 or 12 years. One manufacturer thinks this assures the industry of an active modernization market for at least the next 15 to 25 years.

Another important development has been the movement of industry to three or four-story buildings in the suburbs. These smaller buildings, which are the bread and butter segment of the new equipment market, are being designed with tenant comfort in mind, which means elevators or escalators. This trend has increased the sale of low-lift, or geared, equipment and hydraulically-operated lifts.

With both the new and replacement markets being what they are, no wonder one manufacturer exclaimed: "We have more business ahead of us than at any other time in our history."

By E. C. KREUTZBERG *Washington Editor*

Contract Acts Coming?

UNSETTLED CLAIMS for government contract terminations exceed $3 billion. Thousands of prime and subcontractors are waiting for decisions.

One solution to the problem: Persuade the 1956 session of Congress to pass a contract settlement act and a property disposal act.

First Step—The U. S. Chamber of Commerce has drafted a bill which closely resembles the Contract Settlement Act of 1944, passed to bring about speedier final settlement of terminated World War II contracts.

Since turning the proposed legislation over to the House Armed Services committee, the chamber has been emphasizing the need for fair and prompt settlements. Big point: It takes over a year to receive a settlement for a cancelled contract which has items totaling more than $500,000. And smaller terminated contracts which should be settled within 60 to 90 days are averaging from 6 to 12 months. Says the chamber: "This delay creates problems of employment adjustment, ties up tremendous amounts of capital and distorts the tax picture for concerns which are operating on a cash basis."

History — Without these two acts, there is no assurance that government approval is final. The General Accounting Office has authority to review and object to previous decisions. There is also a lack of clear-cut authority in regard to disposal of government property. Terminated contractors, who have agreed to serve as government disposal agencies, can wind up with their "necks in a noose" by having this clause in a government contract.

The Hoover Commission report on military procurement says in part: "Plant clearance of government inventory is bogged down. The target time of 60 days is fiction . . . There is lack of uniformity among the departments in their procedures for handling termination claims."

Current Washington feeling: Government agencies realize the need for legislation in the termination field and will support bills which will allow fast, final action on cancelled federal contracts.

Here and There

• The Senate Commerce Subcommittee is mailing 40,000 questionnaires to new car dealers. Purpose: To get their opinions on the current trend in bootlegging, phantom freight and territorial restricting within the industry. Results will be used to determine if there should be added federal legislation to prevent such practices. Various groups have been seeking action against these alleged practices in the past two years.

• Top administration officials are toying with the idea that permanent legislation is needed to cope with such situations as Hurricane Diane. Some feel that it would take a federal agency the size of the old Reconstruction Finance Corp. to handle such major national emergencies.

• The Atomic Energy Commission has issued a regulation which outlines the responsibilities of its industry advisory boards. Crux: Advisory board members can only offer advice, provide recommendations and opinions. A government employee must head these units unless AEC makes public an announcement that an industry chairman will not adversely affect the public interest.

Meet George Ireland: He's the new director of the Communications Equipment division of the Business & Defense Services Administration.

Mr. Ireland is general commercial manager for Bell Telephone of Pennsylvania. He will serve actively with BDSA for six months, then will be available as a trained reservist. He may be contacted in Washington by calling Sterling 3-9200, Ext. 4821.

"To the success of your mechanism"
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THE WILLIAM D. GIBSON COMPANY
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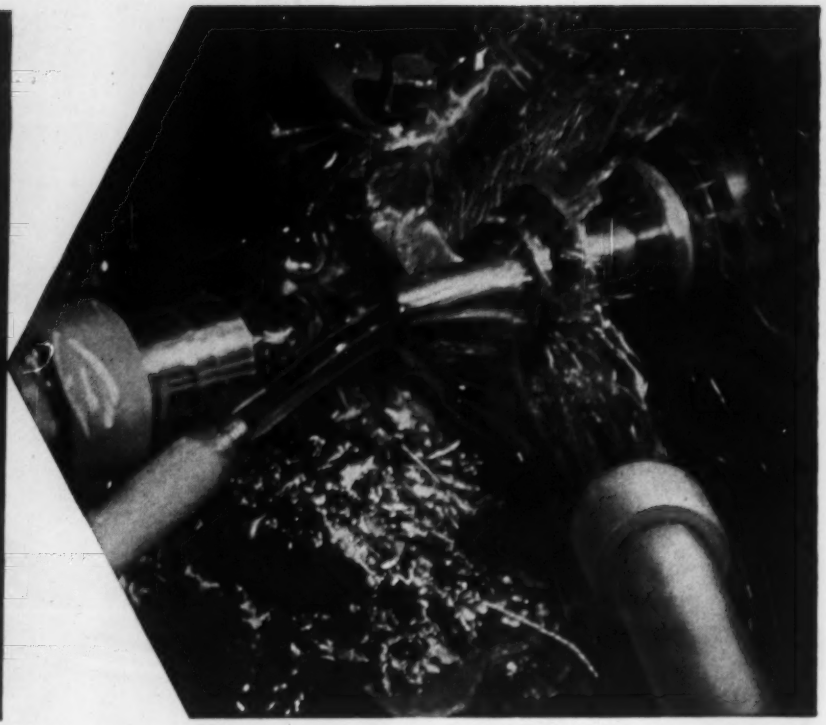
NEW
ATLANTIC
Cutting
Oils



Cut the Tough Jobs Down to Size

No need to pamper these Atlantic Cutting Oils. Put them to work on the toughest cutting job in the shop. Then see the difference they can make . . . in long tool life, top production, even in shop morale.

Notice how Atlantic non-soluble cutting oils give you high production on hot, tough jobs — and without foul odors. Note, too, that the work is visible right through the oil. All these oils are compatible when blended.

Operators like Atlantic Cutting Oils because they do not indelibly stain hands and clothing . . . they make a cleaner shop possible.

You can get full information on these oils and a copy of the valuable new Cutting Oil Selector Chart, which shows how to select the right Atlantic Cutting Oil for the job. Just write for your copy to a nearby Atlantic office, listed here, or to The Atlantic Refining Company, 260 South Broad Street, Philadelphia 1, Pa.

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ATLANTIC

LUBRICANTS · WAXES
PROCESS PRODUCTS

R. C. Bennett Says: 'Sell Salesmen'

THAT'S the response of R. C. Bennett Jr. to the problem of getting and holding the thousands of good salesmen needed in a bustling economy.

The vice president of sales at National Electric Products Corp., Pittsburgh, believes: "A national salesmen's association could prove the popular conception of salesmen is false. He's an executive, not a peddler. Increase the status of the salesman today and you'll produce tomorrow's sales leaders . . . such an association could help more young people plan a career in selling."

Local Level—Mr. Bennett speaks from experience. He sold electrical equipment for a national distributor before joining National Electric in 1950. He translates his philosophy into a program to train and "sell" his sales crew.

"We have several basic requisites. Salesmen should have a college degree or much specialized experience in our product lines—conduit, wire cable fittings and some 30 other electrical products. Our men are selling the company as well as these products."

Plan—Cub salesmen are put inside plants, main offices and warehouses before they are sent to one of 32 sales districts in the National Electric market area.

"Orientation doesn't end there," Mr. Bennett adds. "Each salesman makes a yearly visit to central offices, and we have a comprehensive sales meeting at least once a year in each section of the country.

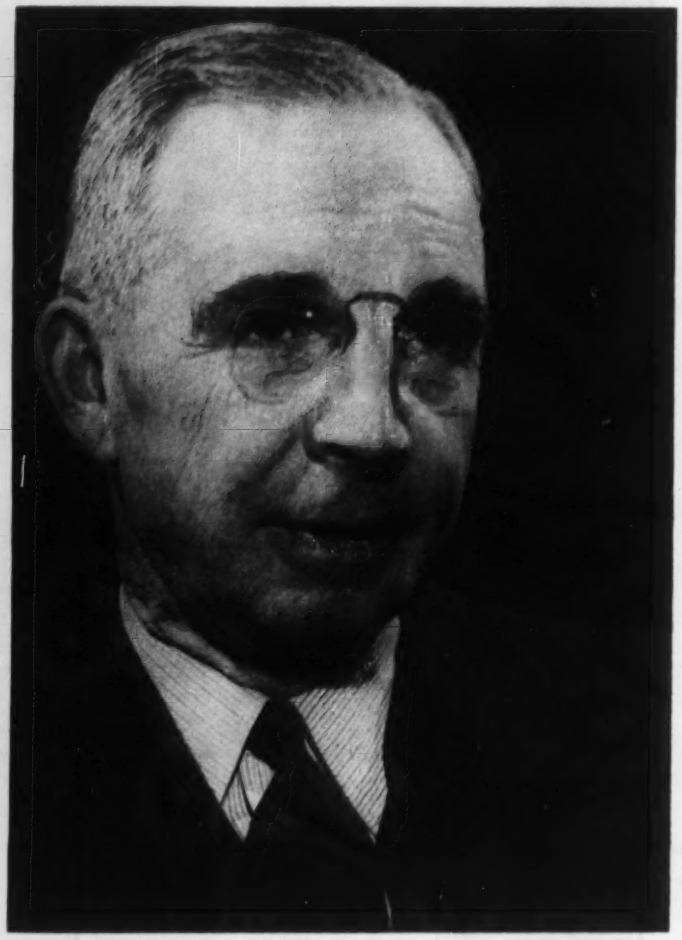
"We want our salesmen to know the company inside out. Then they understand what their job means to the firm."

Results: Better morale and greater incentive among salesmen, making for a low turnover rate.

Two More Steps—To add sales stimulus, Mr. Bennett instituted an incentive plan. "The first step was to form a market research department . . . now we can assign quotas fairly and relate them to an incentive program."

Another route to sales gains has been the company's selective distribution program. It prefers to concentrate all products with one or two good distributors, instead of sprinkling them among a dozen or so. "We have doubled or tripled sales in certain areas," Mr. Bennett reports.

After Hours—This busy executive finds time to supervise his son's little league baseball games and play tennis. He has played in national competition for several years and has won nine tournaments so far this year, including his share of the Western Pennsylvania doubles crown.



Edward L. Ryerson describes board member's role as . . .

Directors Gain More Power

HOW ACTIVE should a board of directors be? What kind of a man should be selected as a director? Should a balance between company and noncompany board members be maintained?

For answers to these and other questions, STEEL sought the opinion of one of the most active metalworking executives in Chicago's business and civic world, Edward L. Ryerson, chairman of the executive committee of Inland Steel Co.'s board of directors.

Former board chairman and chief executive officer of Inland Steel, Mr. Ryerson also is a director for: Joseph T. Ryerson & Sons Inc; Quaker Oats Co.; Illinois Bell Telephone Co.; International Harvester Co.; American Brake Shoe Co.; Atchison, Topeka & Santa Fe Railway Co.; American Iron & Steel Institute. He also has served on the boards of the Northern Trust Co. and the New York Life Insurance Co.

Q: What do you consider the ideal size for a board of directors?

A: I think the size of a company and the number of stockholders should govern the size of the board. The basic consideration should be: Do stockholders have proper representation? Although I'm not too keen about executive committees, I think that when the board gets too large an executive committee is necessary. Boards with over 25 members tend to become unwieldy.

Q: Do you believe in maintaining a balance between company and noncompany members on the board?

A: Yes. Proper representation again is the key. At least 25 per cent of the board should be noncompany members. It's highly desirable to have one-third and in many cases an even higher proportion. But I don't subscribe to the theory that practically all members should be outsiders. It's a mistake, I feel, not to have at least two other corporate officers in addition to the chief executive on the board.

Q: Should directors be selected from specific fields of interest, so that all phases of corporate activities are represented on the board—such as finance, marketing, production, research, personnel?

A: I don't think it makes much difference what their special field is so long as they're qualified to deal with policy questions.

Q: What qualifications should a company look for in a director?

A: His ability and special knowledge, of course. But important factors, too, are the individual's reputation and activities in his own industry and the business and civic affairs of his community. It's just good business to have good community relations — it's something we at Inland Steel place a good deal of emphasis on.

Q: When going outside the firm for directors, where should you look for a board member—in your own industry, that of your customers', or a completely unrelated business?

A: Just look for a man with good business experience and good business judgment. Try to get a director of good reputation in whom the stockholders will have confidence.

Q: Whom within the company should you consider for directors?

A: In addition to the chief executive, I think it's wise to have the executive vice president and treasurer as board members. Others to consider include executives from sales, production, research, your general counsel and comptroller.

Q: What are your views on

whether a director should be a major or minor stockholder?

A: All directors should be stockholders; the size of their holdings is probably not too important. It's my personal opinion that it's also desirable to have all employees be stockholders. We're trying to promote that thinking at Inland.

Q: How active should directors be in company activities?

A: While directors should not be expected to know every detail, they should be sufficiently acquainted with the important factors in earnings. They should know the fundamental influences on costs, sales, markets, products, prices, etc., to be able to make intelligent decisions in policy questions. The administration conducts the operational activities; directors have authority only to hire and fire the chief executive. But directors, I think, should have the opportunity to become acquainted with top personnel to appraise management and its personalities.

Q: You're a strong advocate for a fixed retirement age for directors. What are your reasons? (Inland Steel has a fixed retirement age of 65 for active company personnel, 72 for directors.)

A: I believe in the philosophy of fixed retirement dates for company personnel. It makes opportunities for younger men to grow and develop in the business and gives the firm progressive and successful management to meet the competition of the day. Otherwise, the company would suffer from stagnation and go backward.

It's just as important—or more so—that directors have fixed retirement dates to insure alert, active and sound control of a company which can only result from intelligent, vigorous men. A specific age for retirement is open for discussion—but I firmly believed it should be fixed. Many feel that industrial management should retire at 65. A board member has not the pressures of day-to-day operations and, therefore probably can serve well as a director up to five or more years beyond industrial retirement. I think, too, that when a man completely retires from all business and civic activities, he should retire as a corporate director.

A new bridge, the Mackinac, begins to rise as . . .

Builders Keep On Schedule

THE MACKINAC STRAITS bridge is coming to life. Builders of the $80-million span, linking Michigan's upper and lower peninsulas, expect to complete the two main towers this year.

Vital Statistics—Both towers, being built by the American Bridge Division of U. S. Steel Corp., will be 552 ft above water (equivalent to a 46-story building) and will contain some 7000 tons of structural steel. Merritt-Chapman & Scott Corp., is handling the substructure which is being built on rock, 200 ft below lake level.

The central span will be 3800 ft from tower to tower. Only the Golden Gate bridge in San Francisco bay has a greater span (4200 ft). From anchorage to anchorage, the suspension bridge will be 8614 ft, the longest in the world. Total length, including approaches, will be 26,195 ft.

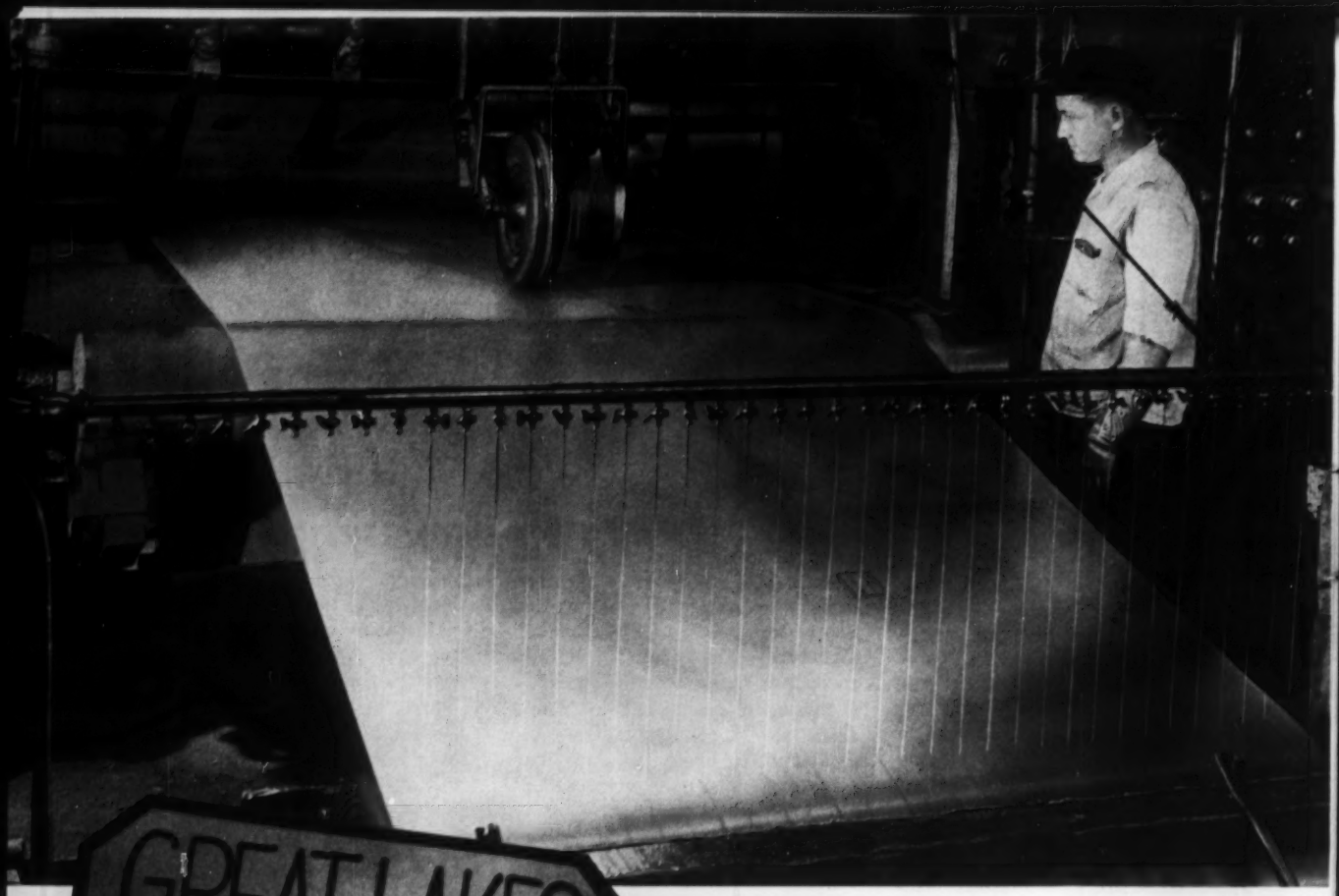
American Steel & Wire Division, U. S. Steel Corp., will reduce nearly 12,000 tons of high carbon steel rods (with diameters smaller than a pencil) for use in the main cables. On the job site, 24 million lb of 0.196 wire will be spliced into endless strands and laid parallel. When spun into place, each of the two main cables will be 2 ft in diameter. A cross section will show some 12,000 individual wires.

Progress — Preliminary plans call for completion by November, 1957. Next year AS&W will begin to put 46,000 miles of wire products in place. It now is preparing the wire needed for two 8362-ft main cables and 368 vertical hanging suspender ropes which will support the roadway spans.

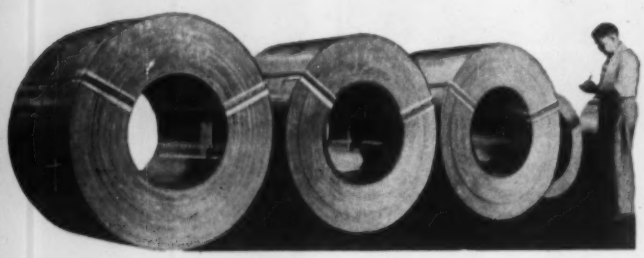
Steel flooring also will be used for the 5-mile, four-lane roadway. In all, some 75,000 tons of steel will go into the fabrication and erection of the Mackinac bridge.

While building is on schedule, the builders warn that they are already concerned with what may happen as fall and winter weather sets in. The unpredictable Mackinac straits could play havoc with the contractors estimates that the bridge will be completed before Christmas, '57.

Weather permitting, an artist's drawing will be a reality by November, 1957



Devices such as the one shown in operation above stamp our steel with our name. Each lift and coil Great Lakes Steel produces carries such a stamp or tag bearing an identification number from which the complete history of the material concerned can be obtained.



How Great Lakes Steel *identifies* quality

Because this identification helps us give better service to our customers, it is an important aid toward an all-important goal. The goal can be summed up: *Give each customer the quality of steel to meet his requirements—when and as wanted.*

Men throughout the mill insist on *quality with service* for our customers.

We invite you to talk over your production problems with a Great Lakes representative. His assignment is to bring into your plant the steelmaking knowledge and experience of the Great Lakes organization.

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Studebaker on the Firing Line

Jim Nance's plans for Studebaker-Packard are misfiring at Studebaker. Family-style labor relations have been thrown out—new dollars-and-cents approach could mean trouble

JIM NANCE'S plans for Studebaker-Packard Corp. appear to be sagging at the South Bend, entering the home stretch.

This year has seen 53,000 Packards and Clippers produced, compared with only 30,000 in all of 1954. Fourth quarter production is aimed at a 90,000-car year, if extended through 1956.

Packard is gaining popularity and stature in the luxury car field as its new engine and assembly plants work like corn poppers. Costs are being brought into line. Packard showed its first black figures in some time during the first half of 1955.

Setting the Stage—Not so happy is the situation at Studebaker. During the first five months of this year, production was almost double 1954 figures—82,000 vs. 50 000 cars. Since then, Studebaker has had trouble keeping production going for two consecutive days, according to one company spokesman.

At midnight, Aug. 31, the Studebaker - UAW contract expired, and workers were quick to formalize into one big strike the many little ones that have plagued the division. Rewriting the contract may well be a lengthy process. Quarterback Nance is up against a line like Notre Dame's on the other side of town.

Background — You will recall that in 1954 the contract at Studebaker was reopened and concessions were made by the union. That didn't happen easily. After turning down a similar plea by management in 1953, the UAW-CIO Local 5, headed then by Louis Horvath, began a study of Studebaker's problems — the corporation's finances, costs, business prospects and position in the industry. It considered the price cuts ranging up to $200 on some models to get them competitive.

When Studebaker renewed its appeal in 1954, union officials of the local were pretty much agreed that Studebaker really needed help. Meetings were held to explain this to the membership, and concessions were proposed. They included replacement of an incentive system by hourly pay, reductions in premium pay and an agreement allowing Studebaker to put into effect "competitive work standards wherever justified."

Opposition — Home-owning Hoosiers noted for making up their own minds, members of Local 5 did not make the concessions easily. "Sell-out to management" was shouted by many. Antiadministration forces in the local rallied about the issue. Faced with a Studebaker threat to shut down if the terms were not ratified, the forward wall of resistance collapsed at a meeting on the Notre Dame football field.

Today, almost all the officials of the local under Horvath, including Horvath himself, are out of office. The election was decided on one consideration, the 1954 concessions. And as Studebaker has attempted to put into action the work standard changes agreed to in 1954, it has met a stone wall of resistance that would do credit to any head coach.

Backfire — Studebaker workers have reason to feel that they have given up plenty already. Pay cuts under the elimination of the incentive system are estimated by some to be 14 per cent. New work standards inevitably would come to mean Studebaker employees would have to work harder for less money. That began for the first time in March, and under present plans, management figures a cut of 1800 workers ultimately will be necessary to get costs in line with production by Detroit standards. The change was to be made gradually. As expected production hikes materialized, the workers were to be hired back.

The plan has scarcely reached first base.

New Deal—That's why the contract talks shaping up loom so im-

Above are the Chrysler Flight Sweep I and Flight Sweep II. Built over a year ago, these cars embody so many features of the Chrysler production models to come that they were held over until recently. A good look will give the feel not only of the 1956 Chrysler offerings but also of what to expect in 1957

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portant. The SUP plan critical to other automakers is secondary to Studebaker-Packard Corp. Nance and his manufacturing vice president, Ray Powers, were able to overcome inefficiency with equipment at Packard. They'll have to get labor co-operation at Studebaker. The old friendly family approach of Studebaker Corp. is being replaced by a profit-and-loss statement approach. A militant labor representation will be on the other side of the table, committed to safeguard the interests of the workers to the hilt.

Studebaker-Packard officials believe the interests of the workers will best be served in the long run by the new work standards. They argue that producing good cars at competitive costs which produce a profit is the premise on which future success of the firm and of its workers lies.

In the Balance—In a real sense, the future of Studebaker will be written in the contract signed in 1955.

Chrysler Signs

With the predictability of a sunrise, Chrysler Corp. signed its contract with the UAW-CIO. Granting SUP along the Ford-GM pattern, Chrysler was forced one step further—a trust fund of similar nature for salaried workers. Its limited size and small likelihood that it will be used make the concession hardly a major triumph for the UAW-CIO.

More significant, however, are wage concessions to 12,700 skilled trades workers, ranging from 8 to 38 cents per hour. Special wage increases for 7500 hourly employees in more than 100 additional classifications range from 2 to 19 cents per hour. They reflect UAW cognizance of the skilled worker discontent with previous settlements.

Equality — Perhaps most significant: Area differentials were eliminated. That means wage increases ranging from 4 to 9 cents per hour for more than 16,000 UAW hourly and salaried employees in six states. Chrysler is believed to be the first major firm in the industry to equalize wage rates on a national scale, eliminating all differentials between the company's out-of-town and Detroit plants.

That step, coupled with the other concessions outlined and the salary grant to Automotive Body Division employees (double time for Sunday work), make the Chrysler Corp. contract the high-water mark thus far in the industry bargaining picture.

Watch Auto Safety

After about four years of defending themselves in the current horsepower race with talk of "safety", automakers are girding the armor of safety in an undisputable fashion. Virtually standard in the industry will be the new "safety door locks" which employ a plate behind the rotary latch mechanism that prevents the rotor from springing off the catch and permitting the door to fly open under impact.

Cases — Also to be announced this year are such devices as recessed steering wheel hubs with spokes designed to cushion impact on the wheel in a collision; padded dash boards; rear view mirrors which will not shower the inside of the car with glass when broken; and, of course, the seat belts already announced by Buick, Chrysler Corp. and Ford Motor Co.

Most industry observers figure that this is the start of a "safety race" in the industry that will create a fertile field for suppliers or would-be suppliers of safety products. Ford is planning to counter Chevrolet claims of "hot" with the pious "safest car on the road" slogan.

Research — Chrysler and Ford each granted Cornell University $200,000 for automotive crash injury research. Both automakers cite data being developed as helpful in the improvement of their vehicles. The portent for future development seems promising.

You can see the ads of the future as the horsepower race is supplanted with the safety race: "You may be outdragged by a Blooper, but you'll never be dragged out of your Whatsis."

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936 994	676,269
May	913,257	621,318
June	825,031	635,540
July	815,061†	543,344
August	.....	523,799
September	.....	364,441
October	.....	312,078
November	.....	616 395
December	.....	761,954
Total	.....	6,896,678

Week Ended	1955	1954
Aug. 6	170,004	124,168
Aug. 13	175,822	119,208
Aug. 20	165.094	121,736
Aug. 27	155,233	113,496
Sept. 3	107,549†	110,995
Sept. 10	95,000*	84,743

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

Flash!

A trend toward more subtle colors on automobile exteriors is forecast by George W. Walker, Ford Motor Co. vice president and director of styling.

"I don't mean that cars for 1956 and later years will be less exciting to the eye from a color viewpoint," he hastens to state, "but indications are that, as a result of public preference, some colors will be softer."

Sounds like 1956 will be a bad year for makers of sun glasses.

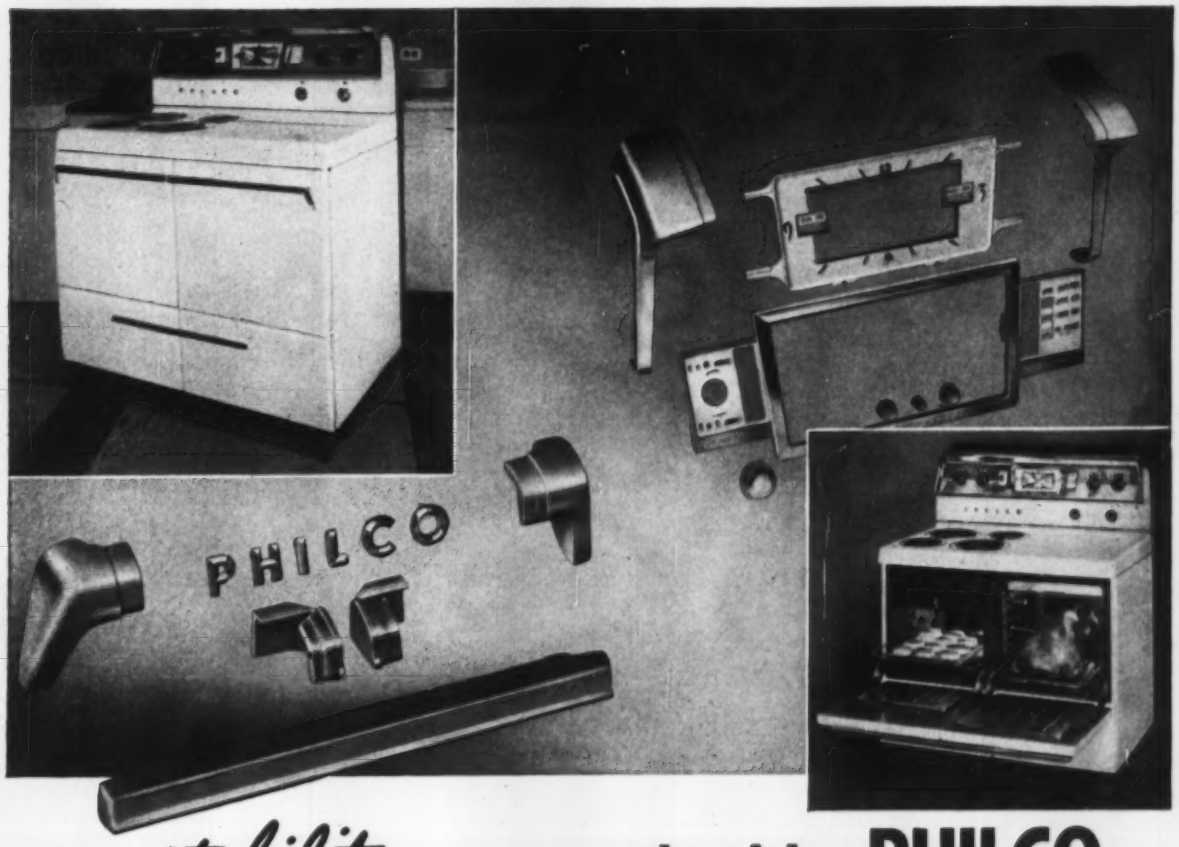
SUP Spreads Out

Supplemental unemployment plan with a breather—that's how the American Motors-CIO settlement shapes up.

In contrast with the earlier Ford, GM and Chrysler contracts, American Motors will not begin its payments into the SUP trust fund until Sept. 15, 1956, more than a year after the others begin. The first benefits will not be payable to laid-off workers at American Motors until Sept. 15, 1957.

Leonard Woodcock, in charge of the union bargaining team, says that the extra year's breathing space was granted in recognition of the company's special economic problems. The settlement will cost 14 cents an hour the first year. After that, costs will parallel those of the other contracts.

WHY ZINC RATES FIRST IN DIE CASTING • NUMBER 3 OF A SERIES



castability — as utilized by PHILCO

These components of the 1955 Philco Roastmeter electric range reveal the wide design latitude possible with ZINC die castings. No other metal or method of production offers product engineers equal freedom of expression with respect to shape, detail and finish.

Consider, for example, two of the castings—the clock face and frame. Not only are these ZINC die castings extremely complex in shape, but the lettering and numerals (both recessed and raised) are sharply defined and the casting surfaces are ready for either plated or painted coatings.

While these attributes of ZINC die castings govern the appearance of the finished product, they also have a decided influence on production costs. The complexity of shape and clean-cut design details minimize the need for secondary operations. And the smooth as-cast surfaces of these ZINC die castings easily take and hold any commercial finish.

Other examples of product engineering with ZINC die castings will be covered in future advertisements in this magazine. Send for our brochure and contact any commercial die caster for the answers to your particular production problems.

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Such a vast stockpile should also tell you how vast must be the *facilities* it feeds. To those facilities, add the skill and experience of the men operating RB&W's modern equipment . . . their long service with the company . . . and the quality control which starts with the raw material and never lets up till shipment. What *must* be the result? A truly reliable source of supply . . . more quality for your money . . . and strong fasteners that never let you down.

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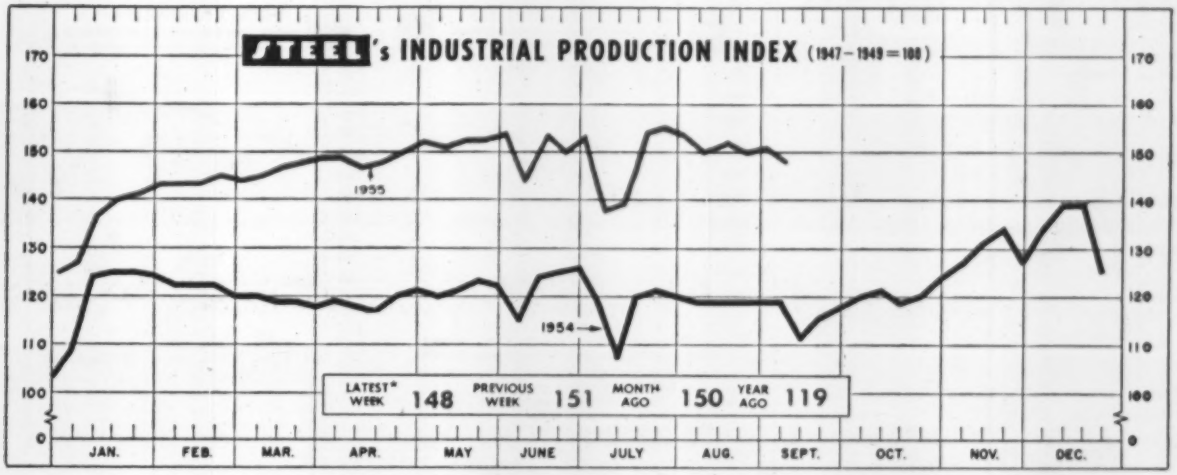

*Week ended Sept. 3. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car loadings 22%; and Auto Assemblies 11%

Outlook for Building: Another Good Year

CONSTRUCTION will have another banner year in 1956. That spells good business weather for many metalworking lines — construction machinery, hardware, home appliances, other household items, building materials and supplies.

The outlook is for 1956 to be a "second-best" year—not quite so good as the one in progress, but still good enough to pass up 1954 (which was the best year construction ever had until 1955 got rolling).

Difference—Spending next year should run right around $40 billion, a good bit over the $37.2 billion of 1954 but under the record $40-plus billion virtually certain to be spent this year.

The 1956 product mix, though, will be a little different than last year and this. Industrial and commercial building will take some of the glamour away from the housing boom.

Gains — Industrial construction has been picking up steam since early this year. If predictions pan out, second and third-quarter spending by business will set new records for those periods of the year. An indication is August contract letting: Over-all, awards fell off, but industrial continued to widen its margin over last year.

The population's trek to the suburbs is the big reason for the strong position of commercial building — new stores, theaters, shopping centers. An added splash is modernization and building in downtown areas, sprucing up to meet the competition of the new suburban rivals.

Dips—The continuing rise of industrial and commercial building, though, won't be able to quite make up for the expected drop in housing construction, since housing accounts for about one-third of the nation's construction bill. And it's pretty much agreed that housing will dip in 1955.

About 1.3 million nonfarm houses will be built this year, just a shade below 1950's record 1.4

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,264[1]	2,255	1,525
Electric Power Distributed (million kw-hr)	10,800[1]	10,906	9,227
Bitum. Coal Output (1000 tons)	9,660	9,480	7,513
Petroleum Production (daily avg.—1000 bbl)	6,684[1]	6,700	6,141
Construction Volume (*ENR*—millions)	$330.3	$265.3	$376.7
Automobile, Truck Output (*Ward's*—units)	107,549[1]	155,233	110,775
TRADE			
Freight Car Loadings (1000 cars)	780[1]	792	677
Business Failures (Dun & Bradstreet, no.)	190[1]	180	184
Currency in Circulation (millions)[3]	$30,268	$30,288	$29,923
Dept. Store Sales (changes from year ago)[3]	+9%	+6%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,030	$18,447	$17,575
Federal Gross Debt (billions)	$278.2	$276.9	$275.0
Bond Volume, NYSE (millions)	$22.2	$25.1	$14.7
Stocks Sales, NYSE (thousands of shares)	9,062	9,795	9,613
Loans and Investments (billions)[4]	$84,098	$84,210	$82,977
U. S. Govt. Obligations Held (billions)[4]	$30,972	$31,261	$36,107
PRICES			
STEEL's Finished Steel Price Index[5]	207.63	207.63	194.19
STEEL's Nonferrous Metal Price Index[6]	260.0	259.1	214.9
All Commodities[7]	110.5	110.5	110.0
Commodities Other than Farm & Foods[7]	117.1	117.0	114.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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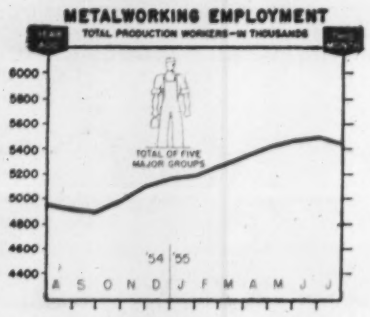
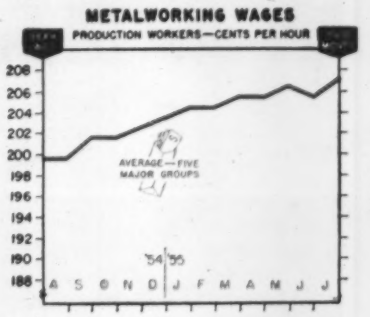
and Rivet-setting Machines

THE BUSINESS TREND



1954	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
July	969	809	1,111	751	1,279
Aug.	967	820	1,095	766	1,238
Sept.	965	821	1,097	785	1,183
Oct.	969	829	1,093	800	1,249
Nov.	988	844	1,092	811	1,334
Dec.	1,002	843	1,106	809	1,375
1955					
Jan.	1,013	834	1,109	800	1,400
Feb.	1,032	844	1,125	803	1,426
Mar.	1,057	860	1,144	803	1,447
Apr.	1,076	868	1,164	804	1,462
May	1,096	877	1,174	809	1,458
June*	1,120	882	1,185	814	1,450
July*	1,112	874	1,168	812	1,438

*Preliminary
U. S. Bureau of Labor Statistics
Charts copyrighted, 1955, STEEL



1954	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
July	211	189	201	182	212
Aug.	210	190	201	181	213
Sept.	214	191	203	182	216
Oct.	213	192	203	184	216
Nov.	214	193	203	184	218
Dec.	214	194	204	184	219
1955					
Jan.	216	195	203	185	220
Feb.	215	195	204	185	220
Mar.	216	195	205	185	221
Apr.	217	195	206	186	220
May	218	196	207	187	222
June*	221	195	208	186	218
July*	224	196	208	188	220

*Preliminary
U. S. Bureau of Labor Statistics

million. Reasons given for a drop next year are tighter credit and a diminishing market (because of the relatively low current rate of family formations).

Of those two, credit will probably be the bigger factor, because recent surveys tend to show that housing demand has lost little if any strength in spite of near record building. Credit brings the government into the picture and another reason why construction will be good in '56.

Next year is an election year. With a Republican administration and a Democratic Congress, neither side can afford to let any part of the economy slide down hill very far. Pump priming—easier credit for homes, public works and highway projects—would be undertaken. More likely: the industry will get along under its own power. Either way, the building outlook is bright.

Auto Outlook . . .

The automotive industry also exerts powerful pressures on the nation's business. A good year is being looked forward to, but the industry will have to scramble to even come up with a "second best."

The reason: 1955's torrid production pace certainly can't be duplicated two years in a row. For the year some 8 million cars are scheduled to roll off the lines, bettering the previous best year (1950) by about 20 per cent and well above even the most optimistic forecasts of last fall.

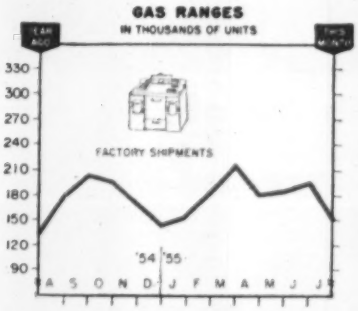
Helping sales keep somewhere close to output were new engines and styling, wrap-around windshields, screaming paint jobs. It's unlikely that the facelifts planned for the 1956's will have the same tremendous impact saleswise that a complete restyling had.

Likely to be caught in a profit squeeze next year are auto suppliers, says Value Line Investment Survey, New York. This year, high volume allowed some suppliers to show better profits than the automakers. But a change is already in the wind.

The clouds: Lower auto production—meaning lower parts volume, more intensive competition for the available business, higher costs because of wage increases and material prices.

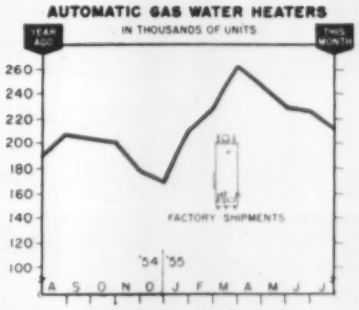
Trucks Pick Up . . .

On the brighter side are trucks. Target for the year is 1,250,000 completions. Heavy trucks are do-



Shipments—Units	1955	1954	1953
Jan.	152,900	137,000	169,200
Feb.	186,200	152,900	185,900
Mar.	217,300	188,200	208,200
Apr.	182,300	172,400	220,300
May	187,400	163,800	181,000
June	196,500*	174,300	166,600
July	149,500*	134,500	159,000
Aug.	.....	179,400	186,800
Sept.	.....	203,900	209,500
Oct.	.....	197,100	203,900
Nov.	.....	174,000	158,500
Dec.	.....	147,300	134,400
Total	.....	2,024,800	2,183,300

Gas Appliance Mfrs. Assn.
*Preliminary



Shipments—Units	1955	1954	1953
Jan.	210,900	164,400	189,900
Feb.	228,400	175,000	194,200
Mar.	263,100	187,800	207,400
Apr.	245,200	200,800	209,500
May	229,400	195,600	183,300
June	227,100	206,700	181,200
July	212,500*	190,300	178,900
Aug.	.....	207,100	168,100
Sept.	.....	205,500	179,000
Oct.	.....	202,000	194,300
Nov.	.....	179,100	155,000
Dec.	.....	166,800	141,900
Total	.....	2,281,100	2,182,700

Gas Appliance Mfrs. Assn.
*Preliminary

ing particularly well (up more than 25 per cent from last year). For that reason the independents are making a strong showing in 1955. On the other hand, production of the Big Four (Chevrolet, Ford, Dodge and GMC) is down about 5 per cent for the first six months—mainly because their production includes many light trucks where activity is slower, says *Ward's Automotive Reports.*

Freight Shipments Rise . . .

A reason for the increase in heavy truck sales is rising intercity truck tonnage. American Trucking Association Inc. says second-quarter shipments were 6.2 per cent above the old high mark of 1953, 14 per cent over 1954.

The upward trend began last October. Prior to that the industry had recorded four consecutive quarters of declining tonnages. Almost 63 million tons of freight were hauled in second quarter, compared with little over 55 million tons in the same period of last year. The difference might have been greater had it not been for the trucking strike in the Western States.

The radio and television industry has a chance to set new retail sales records this year, says James D. Secrest, executive vice president of Radio Electronics-Television Manufacturers Association. Intensive dealer promotion during National Radio and Television Week, Sept. 18-24, is the key.

New High for TV . . .

Mr. Secrest sees the possibility of 7.5 million TV sets and 12.3 million radios being sold this year. Last year 7.4 million TVs were sold, a new record. Radio's best year was in 1947 when over 20 million went into the hands of customers hell-bent on the postwar buying splurge. A 12.5-million year would be the best in about 5.

In viewing the outlook for the industry, he points to the rapidly growing second set market. "One out of every five television receivers sold so far this year has gone to a second set customer. As this trend is rising, the ratio is expected to be one out of three by the end of the year."

In addition to that market, about 15 million families have yet to buy a set, and another 12 to 15 million are potential buyers because they are small screen owners. Color TV: "The size of the market will depend to a large degree on (dealer's) salesmanship."

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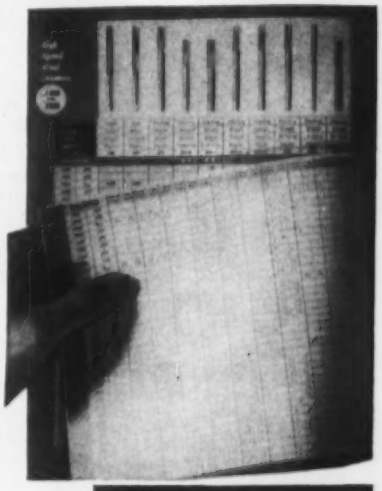

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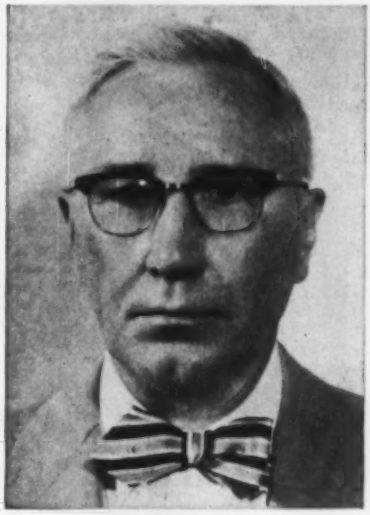


ROBERT M. WAPLES
. . . Garlock Packing Co. president

JOHN B. KENDALL
. . . Ford Chicago stamping plant mgr.

Loren J. Westhaver was promoted to vice president-operations for **Columbia - Geneva Steel Division,** U. S. Steel Corp., to succeed **Laurence S. Dahl** who continues as a vice president handling special assignments. **J. D. McCall,** assistant general manager-operations, succeeds Mr. Westhaver as general manager. All have headquarters in San Francisco.

J. A. Cairns was appointed sales manager, **Allied Research Sales Corp.,** Baltimore, marketing subsidiary of Allied Research Products Inc. He was manager of special projects.

Arthur E. Heimbach was promoted from executive vice president to president of **General Railway Signal Co.,** Rochester, N. Y. He succeeds **Herbert W. Chamberlain,** now chairman of the executive committee.

John F. Bergman was made national sales manager, punch division, **Pivot Punch & Die Corp.,** North Tonawanda, N. Y. He was assistant to the vice president.

Robert U. Haslanger was appointed director of industrial sales, **Stauffer Chemical Co.** He continues headquarters in New York where he has been eastern sales manager. He fills the vacancy created by the death of **T. A. Haschke.**

Robert M. Waples was elected president of **Garlock Packing Co.,** Palmyra, N. Y. He succeeds **George L. Abbott** who was elected chairman and chief executive officer. Mr. Waples was executive vice president. **William M. Sheffeld** was elected a vice president.

E. H. Hollenback, assistant chief metallurgist, succeeds **Earl Penrod,** retired, as chief metallurgist at the Johnstown, Pa., plant of **Bethlehem Steel Co.**

Charles C. Hess was made production manager and **Joseph C. Spickler** director of human relations for **Pressed Steel Tank Co.,** Milwaukee.

Porter R. Wray was appointed assistant chief metallurgical engineer, **United States Steel Corp.,** Pittsburgh. **A. W. MacLaren** was made metallurgical engineer-alloy steels and **J. R. Hamilton** assistant metallurgical engineer - structural, plate and high strength steels. Mr. MacLaren succeeds Mr. Wray and Mr. Hamilton fills the position vacated by the late **C. E. Loos.**

John F. Thurston was made general manager, **Electro Dynamic Division,** General Dynamics Corp., Bayonne, N. J. He succeeds **Milton E. Hall,** who assumes new duties at Bayonne as works manager. **Dean W. Paul** continues as sales manager.

John B. Kendall was named manager of **Ford Motor Co.'s** new Chicago stamping plant. He is succeeded by **F. J. Bushroe** as manager of the Buffalo stamping plant.

Charles F. McKenna Jr. was elected treasurer, **Johnson & Hoffman Co.,** Mineola, L. I., N. Y., an associate of Superior Tube Co. He was director of purchases for Superior Tube. **Elmer W. Hayes** was appointed acting purchasing director of Superior Tube.

J. R. Woodruff was appointed assistant sales manager, **Electric Controller & Mfg. Co.,** Cleveland. He is succeeded at Los Angeles as Pacific Coast district manager by **C. A. Mitchell Jr. O. J. Archer** replaces Mr. Mitchell as district manager in Houston.

J. W. Morgan was made sales manager, eastern tractor equipment division, **Hyster Co.,** with headquarters at Peoria, Ill. Since 1952 he has been assistant sales manager of that division in Danville, Ill.

John C. Lee was made chief engineer of **Wayne Pump Co.'s** industrial division, Salisbury, Md.

Larry R. Oswald was made Chicago district manager of **Edison Storage Battery Division,** Thomas A. Edison Inc., to succeed **Harvey A. Drew** who retires Oct. 1. **E. L.**

Krauss was made manager of a new district office in Atlanta.

Dr. David B. Parkinson and **John H. Harris** were elected vice presidents of **Brush Electronics Co.**, Cleveland, a unit of Clevite Corp.

E. R. Kohl was made purchasing agent for **Parish Pressed Steel Division**, Dana Corp., Reading, Pa.

Joseph White joined **Green River Steel Corp.**, Owensboro, Ky., as general manager of sales.

Richard G. Wells was made sales manager, **Minnesota Rubber & Gasket Co.**, Minneapolis. He was New York district manager.

Thomas R. Darmody was named an assistant general manager of **Vitro Engineering Division**, Vitro Corp. of America, New York.

John Reitano, superintendent of planning, was made chief inspector for **Oneida Products Corp.**, New York. **Charles Capparelli** becomes planning manager. **Lee Chamberlin**, former chief tool engineer, becomes master mechanic to replace the late **Robert Hilgenberg.**

Harold R. Dueber was named superintendent of transportation at **Republic Steel Corp.'s** Warren, O., district steel plant. He succeeds the late **M. A. Cassidy.**

William Patterson Jr. was appointed a jet engine specialist for aircraft engine hydraulic controls and equipment of **Vickers Inc.**, Detroit.

Donald S. Perley was appointed comptroller of **Axelson Mfg. Co.**, Los Angeles, division of U. S. Industries Inc.

John A. Shackleton was named manager of pressure vessel engineering for **Kaiser Steel Corp.'s** Napa, Calif., fabricating division plant.

M. C. McKeown was made Philadelphia district sales manager for **Cochrane Corp.**

Arthur H. Quigley retires from **American Brass Co.**, subsidiary of Anaconda Co., New York, after more than 53 years of service. He has served since 1950 as chairman of the board.

M. B. GARBER

E. C. BREKELBAUM

. . . vice presidents of Thew Shovel Co.

M. B. Garber, director of sales, and **E. C. Brekelbaum**, director of methods, were elected vice presidents of **Thew Shovel Co.**, Lorain, O. **C. B. Smythe**, president, also assumes the position of treasurer to replace the late **H. L. Reynolds.**

Harry N. Rider was elected a vice president of **Automatic Sprinkler Corp. of America**, Youngstown. He continues as manager of the production and technical divisions.

David T. Marvel, a vice president of **Olin Mathieson Chemical Corp.**, New York, was appointed vice president in charge of sales of the metals division. Its operations have been expanded with the establishment of separate sales organizations for brass and aluminum roll bond. **E. W. Sherman**, former sales manager, metals division, was made sales manager for all brass products. **H. F. Devens**, former assistant to the general manager, was named sales manager for roll bond products.

R. W. Franz was made sales manager for the General Line products of Pacific Metal Division of **Continental Can Co.**, New York.

A. E. Van Cleve, formerly vice president of Crucible Steel Co. of America, joined **Barium Steel Corp.** as vice president. He will be in New York.

V. W. Carpenter succeeds **G. H. Cole** as associate director of research, **Armco Steel Corp.**, Middletown, O. Mr. Cole will devote full time as consulting engineer for magnetic materials. **D. C. Dieterly** was made supervisor, magnetic research laboratory.

John S. Newton was made vice president in charge of engineering, **Goodman Mfg. Co.**, Chicago. He has been with Baldwin-Lima-Hamilton Corp. for the last seven years, most recently as vice president and manager of the testing equipment division.

William R. Alexander was appointed director of engineering, **Steel Products Engineering Co.**, Springfield, O. Formerly assistant director, he replaces **D. L. Getz**, resigned.

David M. Stern was appointed director of purchases by **Gordon Enterprises**, North Hollywood, Calif. He will be assisted by **Allan L. Grotsky**, who was named purchasing agent.

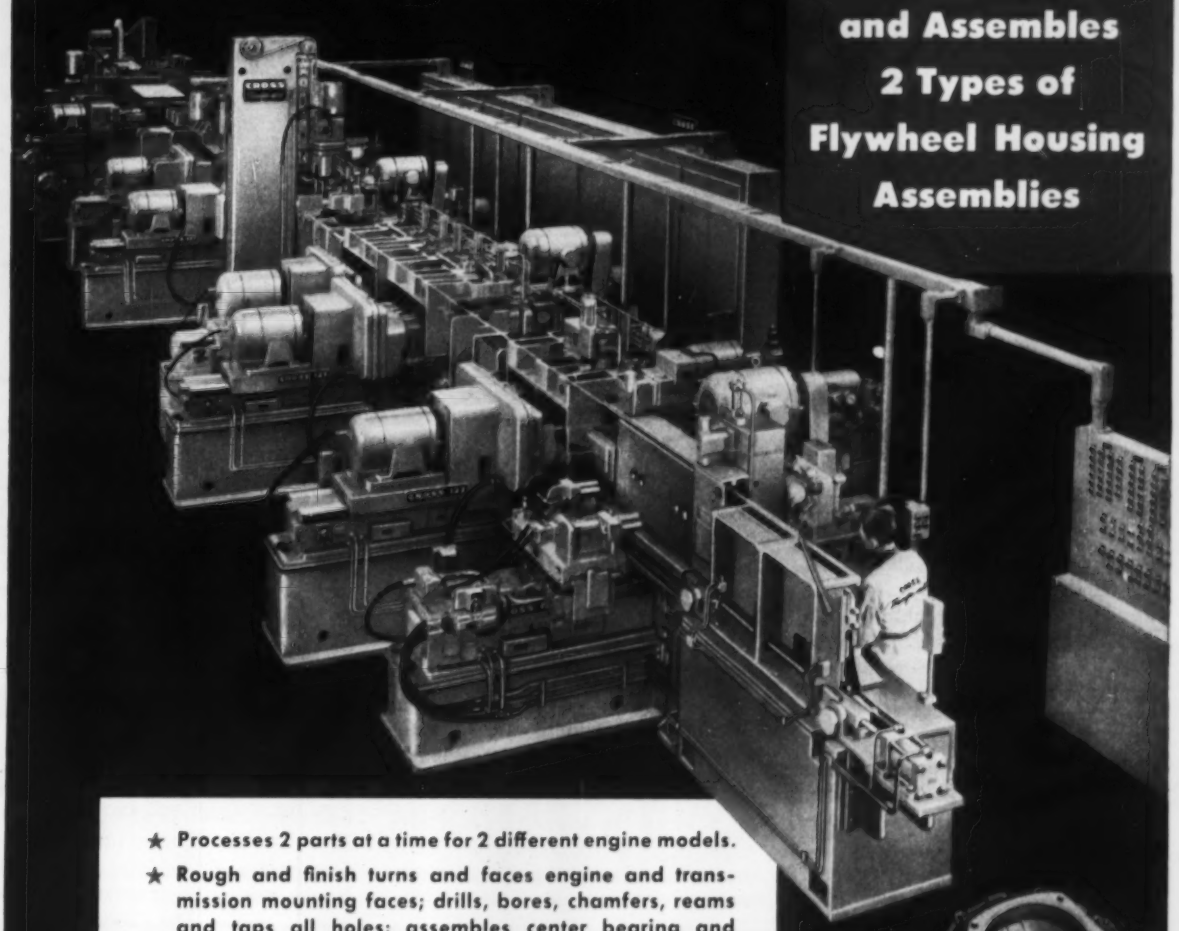
Hubert B. Smith was made director of product engineering at the Claymont, Del., plant of **Colorado Fuel & Iron Corp.** He will supervise research, development and quality control. He formerly was vice president-research at Great Lakes Steel Corp.

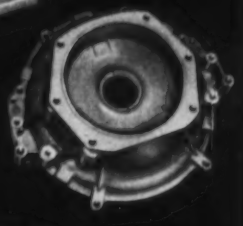
Raymond J. Wean, president of Wean Engineering Co. Inc., was elected a director of **Federal Machine & Welder Co.**, Warren, O.

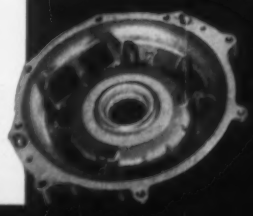
C. Allan Fee was elected vice pres-

Another Transfer-matic by Cross

Bores, Faces, Drills and Assembles 2 Types of Flywheel Housing Assemblies







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GEORGE CAGEN
. . . Lux Clock chief product eng.

CARLES F. ROBY
. . . Heald Machine president

ident and secretary of **ACF Industries Inc.**, New York.

Arthur B. Morse was elected vice president and western sales manager, **Mexico Refractories Co.**, Mexico, Mo. He served for the last five years as California district manager.

International Resistance Co. appointed **Richard Johnson** manager and **Thomas E. Davis** a salesman at its Syracuse, N. Y., sales office.

C. O. Petersen was appointed district sales engineer in Pittsburgh and surrounding areas for **W. W. Sly Mfg. Co.**

Richard L. Boorman was appointed director of cost planning for **Kaiser Steel Corp.**, Fontana, Calif.

Leopold Sweet, division industrial engineer of **Rockwell Mfg. Co.'s** instrument division in Tulsa, Okla., was made staff industrial engineering training supervisor with headquarters in Pittsburgh.

George Cagen was made chief product engineer of **Lux Clock Mfg. Co.**, Waterbury, Conn. He heads a new department devoted to developing new products and adapting Lux timing devices to broader application in the original equipment field.

C. S. Wiedman was made manager of carbide products development engineering for **Carboloy Department**, Detroit, General Electric Co.

R. S. Reynolds Jr. was made chairman of **Robertshaw-Fulton Controls Co.**, Greensburg, Pa., to succeed his father, the late **R. S. Reynolds Sr.** Mr. Reynolds has been a director and financial vice president. **J. Louis Reynolds** and **John A. Robertshaw Jr.** fill two vacancies on the board.

Raymond F. Stevens joined **Acheson Colloids Co.**, Port Huron, Mich., as research chemist.

Stanley L. Furman was made an assistant treasurer of **National Supply Co.**, Pittsburgh.

Carles F. Roby was elected president of **Heald Machine Co.**, Worcester, Mass., which has been acquired as a subsidiary of Cincinnati Milling Machine Co. **Richard A. Heald** steps up to chairman of the board and **Robert S. Heald** continues as vice president and secretary. Mr. Roby was a vice president and director of Cincinnati Milling Machine Co.

Hamilton F. Biggar Jr. was made manager, new product development, **Reliance Electric & Engineering Co.**, Cleveland. **Robert R. Hayes** was made supervisor of the atomic power department.

Edward W. Church was promoted from superintendent to resident manager of the North Birmingham, Ala., pipe plant of **U. S. Pipe & Foundry Co.**

Vernon D. Enwald was named Midwest regional manager at Chicago for **Warner Electric Brake & Clutch Co.** He was regional manager on the West Coast.

OBITUARIES . . .

Thomas C. Phillips, 54, vice president-sales for **Pittsburgh Steel Products Co.**, subsidiary of Pittsburgh Steel Co., Pittsburgh, died Aug. 29.

H. Alfred Solomon, vice president, **Max Solomon Co.**, Pittsburgh, died Aug. 29.

Edwin W. Seeger, 63, vice president and an assistant secretary of **Cutler-Hammer Inc.**, Milwaukee, died Aug. 28.

Harold W. Pond, vice president-general manager, **Timms Spring Co.**, Elyria, O., died Aug 21.

Joseph B. Morton, 77, retired partner of **M. O. Devers Screw Machine Products Co.**, Dayton, O., died Aug. 23.

Arthur M. Wickwire Jr., 57, president, **Power Controls Inc.**, Yonkers, N. Y., died Aug. 28.

Edwin L. Oliver, 77, mining engineer, founder and chairman of **Dorr-Oliver Inc.**, died at Piedmont, Calif., Aug. 30.

PHOTO COURTESY CLARK EQUIPMENT COMPANY, BATTLE CREEK, MICHIGAN

Clark towing tractor—with Chrysler power and fluid coupling—applies 12,000 pounds drawbar pull to big materials handling jobs

Here is materials handling—airport style. Chances are you've seen towing tractors pulling airplanes around airports all over the country without ever thinking of it as materials handling. It is though, and a mighty important type too. As planes become larger and airport space more critical, as schedules are stepped up and more flights are added, the job of keeping planes in the right places at the right times becomes an increasingly important factor.

It is only natural that the airlines employ small, powerful towing tractors to do the job. Take the Clarktor 120, shown here towing a Constellation from unloading ramp to service point. The airlines know it can handle the job quickly and efficiently. It can apply 12,000 pounds of drawbar pull, if necessary.

The Clarktor 120, like all gas-powered Clark towing tractors, is Chrysler-powered. Chrysler Ind. 32, 265 cubic inches displacement engine drives the 120. And Chrysler gýrol Fluid Coupling connects engine and transmission, protects equipment, drive components and airplane from wear and tear of sudden starts and stops.

Manufacturers find it pays to power with Chrysler. Not only is it an industrial engine their customers recognize, it is also an industrial engine that assures maximum performance for their equipment, an engine that is factory-equipped to their needs. Gasoline, natural or L-P gas burning carburetors, vertical or horizontal magnetos, gýrol fluid coupling, 3, 4 or 5-speed transmission, and the New Chrysler Industrial Torque Converter—these and other equipment can be factory supplied to their order.

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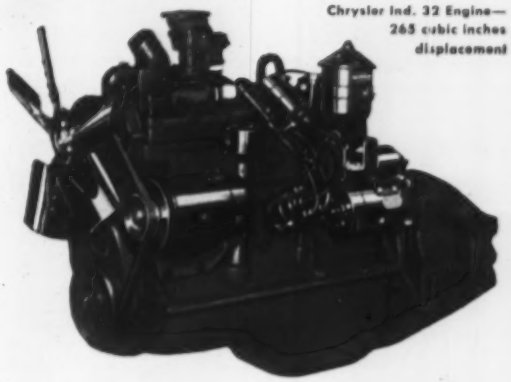

Chrysler Ind. 32 Engine—265 cubic inches displacement

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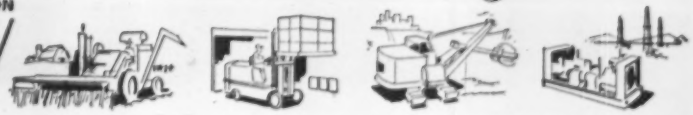

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IN CANADA:
SANDVIK CANADIAN LTD., P.O. Drawer 430, Station O, Montreal 9, P.Q.

88-104

More uses for galvanized material are seen as . . .

Wheeling Opens Line

WHEELING STEEL CORP.'s $4-million continuous galvanizing line at Martins Ferry, O., is in operation. This is the second line at the plant; the first went into production in November, 1953.

With the No. 2 and larger line (at right, above) in operation, Wheeling Steel has flexibility to meet all types of customer requirements in the galvanizing field. (Its product: SofTite galvanized sheets and strip.)

The development of new quality coatings, officials say, is expected to open wider fields of application, with the promise of considerable expansion in the galvanizing industry.

Large Capacity—The new line at Martins Ferry is equipped to handle 10 gage and lighter material in widths up to 48 in., either in cut lengths or in coils. As much as 50 tons per hour of heavy gage material can be produced, with line speeds up to 300 fpm.

The electric induction pot holds 175 tons of metal. Electrical inductors are capable of furnishing 2300 kw of power, enough to supply electricity for a medium-sized city.

Production from the line is expected to be about 18,000 tons per month, or about 50 per cent greater than output of the first line. It is 700 ft long—about 150 ft longer than the original line. Its height, from the bottom of the looping pit to the top of the air coolers in the tower, is about that of the 12-story Wheeling Steel building in Wheeling, W. Va.

This is the fourth continuous galvanizing line in operation using Wheeling's Cook-Norteman process. Two are at the Martins Ferry plant; one, at the Hamilton, Ont., plant of the Steel Co. of Canada; the fourth, at the Warren, O., plant of Republic Steel Corp. Two other lines under construction have been licensed to use the process: One at the Dover, O., plant of Reeves Steel & Mfg. Co.; the other at the Gadsden, Ala., plant of Republic Steel.

Cincinnati Milling Buys Heald

An undisclosed subsidiary of Cincinnati Milling Machine Co. purchased the plant of Heald Machine Co., Worcester, Mass. Heald products, including precision boring machines, internal grinders and rotary table surface grinders, will continue to be built and sold by the Heald Machine Co. Richard A. Heald is board chairman and Carles F. Roby is president. Mr. Roby has been a vice president and director of Cincinnati Milling Machine Co. For the six months ended June 30, 1955, Heald shipments amounted to $9.7 million. On Aug. 1, the backlog of unfilled orders was $11 million.

GE Expanding Two Plants

General Electric Co., Schenectady, N. Y., will spend more than $1 million expanding two of its plants. At Bridgeport, Conn., the firm is converting a warehouse to fan manufacturing at a cost of $500,000. At Pittsfield, Mass., work has started on a $600,000 alteration and addition project at its distribution transformer department.

Enlarges Warehouse Facilities

Solar Steel Corp., Cleveland, increased facilities at its Worcester (Auburn), Mass., warehouse. The company added new shearing, edging and tempering equipment and 48-in. high-speed precision sheet and strip slitter. Solar's Worcester plant is operated under the direction of J. B. Ribakoff, vice president. Hugh H. Trumbull is district sales manager.

Metal Carbides Building Plant

Metal Carbides Corp., Youngstown, is constructing a $400,000 office and plant addition at its Boardman, O., plant. The firm will move all operations there. It produces metal carbide for cutting edges and similar purposes.

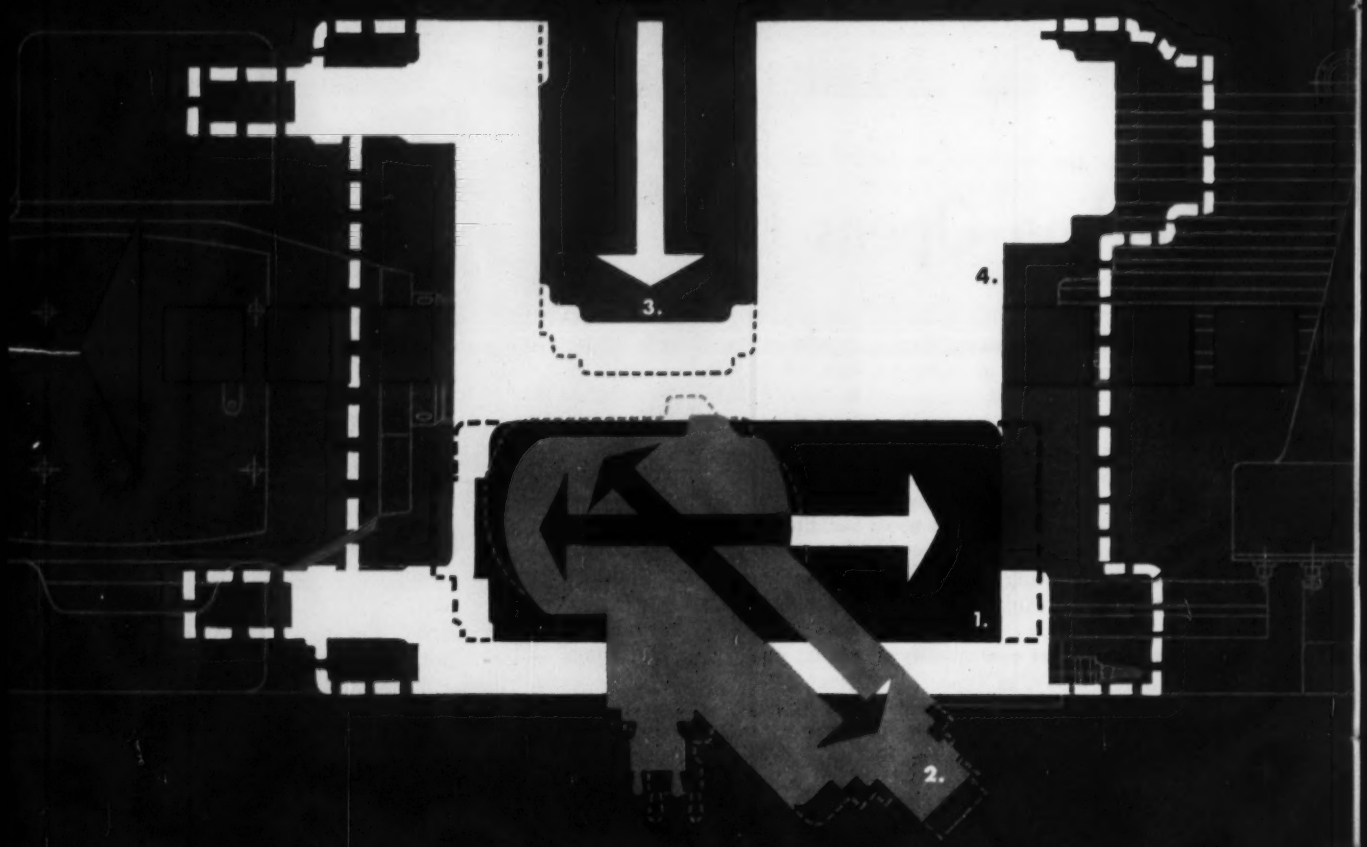
Plans $40 Million Building

Union Carbide & Carbon Corp. plans to build a 41-story building on the block between Park and Madison avenues and 47th and 48th streets in New York. It will house the home offices of the corporation and its divisions and subsidiaries, including: Bakelite Co., Carbide & Carbon Chemicals Co., Electro Metallurgical Co., Linde Air Products Co., National Carbon Co., Pyrofax Gas Corp., Union Carbide International Co. and Union Carbide Nuclear Co. While the

(*Please turn to page* 88)

ACTION That's the Word for Hydra-Slide!

ARROWS SHOW SLIDE MOVEMENTS OF MONARCH'S NEW AUTOMATIC CYCLE CHUCKING LATHE



1, 2. Basic unit, most models—hydraulically operated front slide unit, on which is mounted famous Monarch Air-Gage Tracer. Utilized generally for straight or contour turning, facing, or boring.

3. Hydraulically operated rear slide unit for necking and grooving—is ideal with proper tool setting for facing, for which hydraulic automatic tool relief is provided.

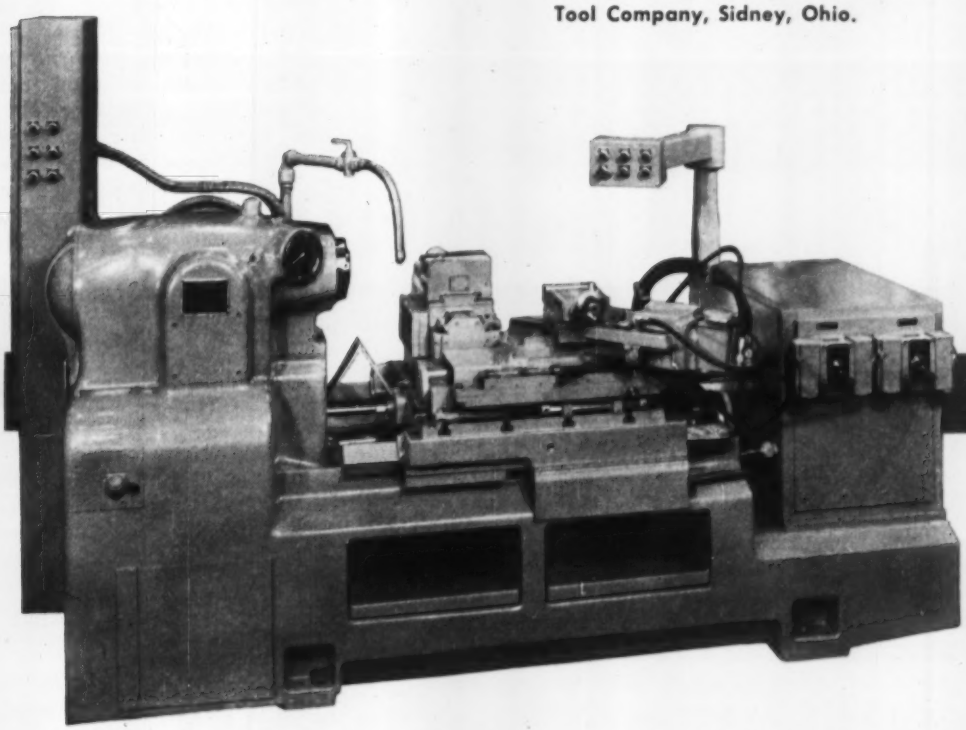
4. Platen with hydraulic movement, on which both front and rear slide units are mounted. Speeds cycle for work piece change!

HERE'S ACTION in the fight against rising production costs—with a fully automatic cycle controlling an extremely effective combination of hydraulic slide movements. Look them over! Here's an exceptionally versatile, high production chucking lathe for both first and second operation work.

Although the typical cycle presumes a tool or tools on both front and rear slides, and is based on the ideal production-wise situation of simultaneous operation of slides—the versatility of the machine is such that many variations can be set up. Of course, there are convenient all-electrical controls for effortless and positive setup.

The Hydra-Slide has ample capacity as to work size and stock removal both, with work diameter capacity up to 15" over front slide unit —up to 13" over rear slide unit—and work drive motor ratings up to 20 H.P.

Here's action—production-wise and cost-wise! You should know *all* about a machine like this. Send the coupon today for our complete illustrated booklet #1703—**The Monarch Machine Tool Company, Sidney, Ohio.**



The Monarch Hydra-Slide. Front Slide, with Air-Gage Tracer, provides smooth, stepless cut for multiple diameters, tapers, faces, radii and chamfers with single-tool economy. One or more tools on rear unit neck, groove, form cut, and face. Both mounted on platen. Send coupon for complete story.

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TURNING MACHINES
ACCURACY • ECONOMY • LONG LIFE
FOR A GOOD TURN FASTER . . . TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY
SIDNEY, OHIO

Please send me your illustrated booklet #1703 on the new Monarch Hydra-Slide.

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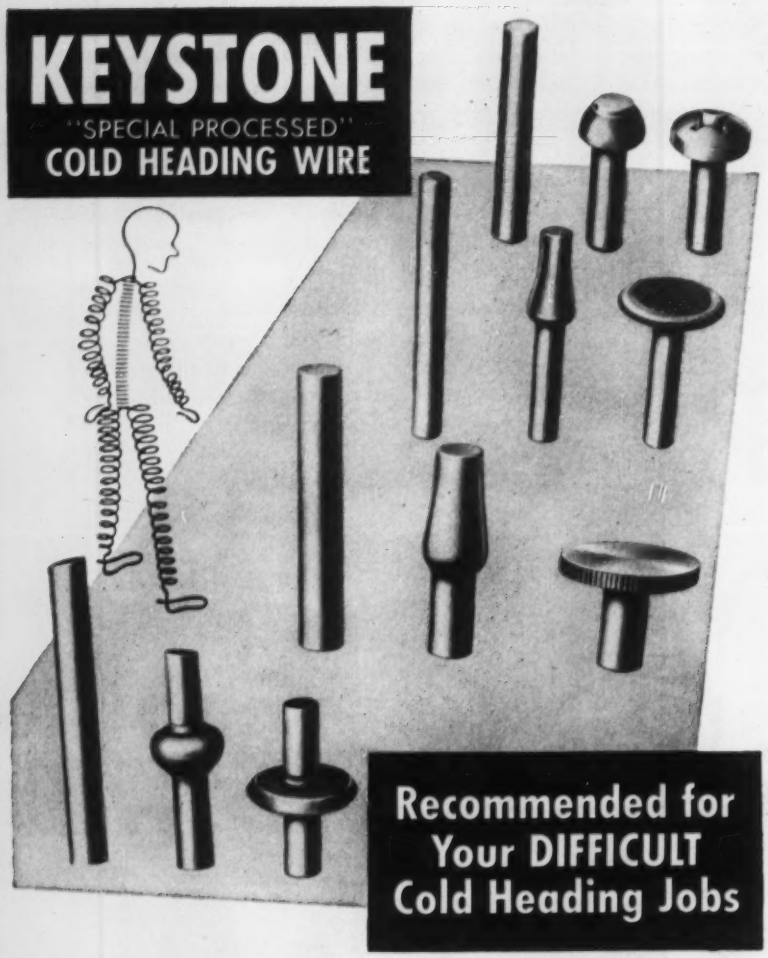


When you have "tough-to-make" cold heading jobs on your production schedule, it will pay you to consider the outstanding advantages offered by Keystone "Special Processed" Wire.

The superior grain flow characteristics of this wire provides the necessary upsetting and die forming qualities to withstand the terrific displacement of metal during the most difficult cold heading process. The structural soundness and uniformity of "Special Processed" Wire further proves itself through trouble-free machine operation, longer die life, and finished products of the highest quality.

If you have a special wire problem . . . large or small . . . let us help you solve it. Contact your Keystone representative or write.

Keystone Steel & Wire Company
Peoria 7, Illinois
Industrial Wire Specialists

(*Concluded from page 85*)

terms of the lease agreement with the New York Central Railroad, owner of an option on the property, were not announced, it is anticipated that the building project will involve an investment of about $40 million. It is hoped that the new building can be made ready for occupancy some time in 1958.

Dominion Bridge Adds Plant

Dominion Bridge Co. Ltd., Montreal, has added the Mt. Dennis plant to facilities operated by its Ontario Division. At Jane street and Trethewey drive in North York township, the plant contains 57,000 sq ft of floor space and will be used for fabricating heavy plate and tank work and all kinds of welded structures. For many years the company has maintained a large fabricating plant in Toronto, equipped primarily for structural steel and light plate fabrication.

Wheelabrator Changes Name

American Wheelabrator & Equipment Corp., Mishawaka, Ind., changed its name to Wheelabrator Corp. The firm makes equipment for blast cleaning, dust and fume control and foundries.

Kaiser Opens Branch Office

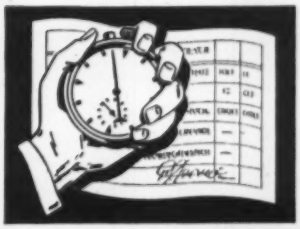
Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., established a branch sales office at 1771 E. Market St., York, Pa., under the managership of A. H. Woodward.

CF&I Operating Big Press

The 3000-ton "push-through" press, one of the largest and fastest in the world, is in production at Colorado Fuel & Iron Corp.'s Wickwire Spencer Steel plant, Claymont, Del. It can produce heads up to 10 ft in diameter and is capable of exerting a maximum force of 6 million lb. It was designed by Verson Allsteel Press Co., Chicago, and stands 68 ft from top to bottom of pit.

After the pressing operation, finished heads are carried from the pit to ground level by an auto-

Faster Shearing at Follansbee



The addition of a big Steelweld Pivoted-Blade Shear in the Pittsburgh warehouse of Follansbee Metals, has greatly speeded the plate service they provide.

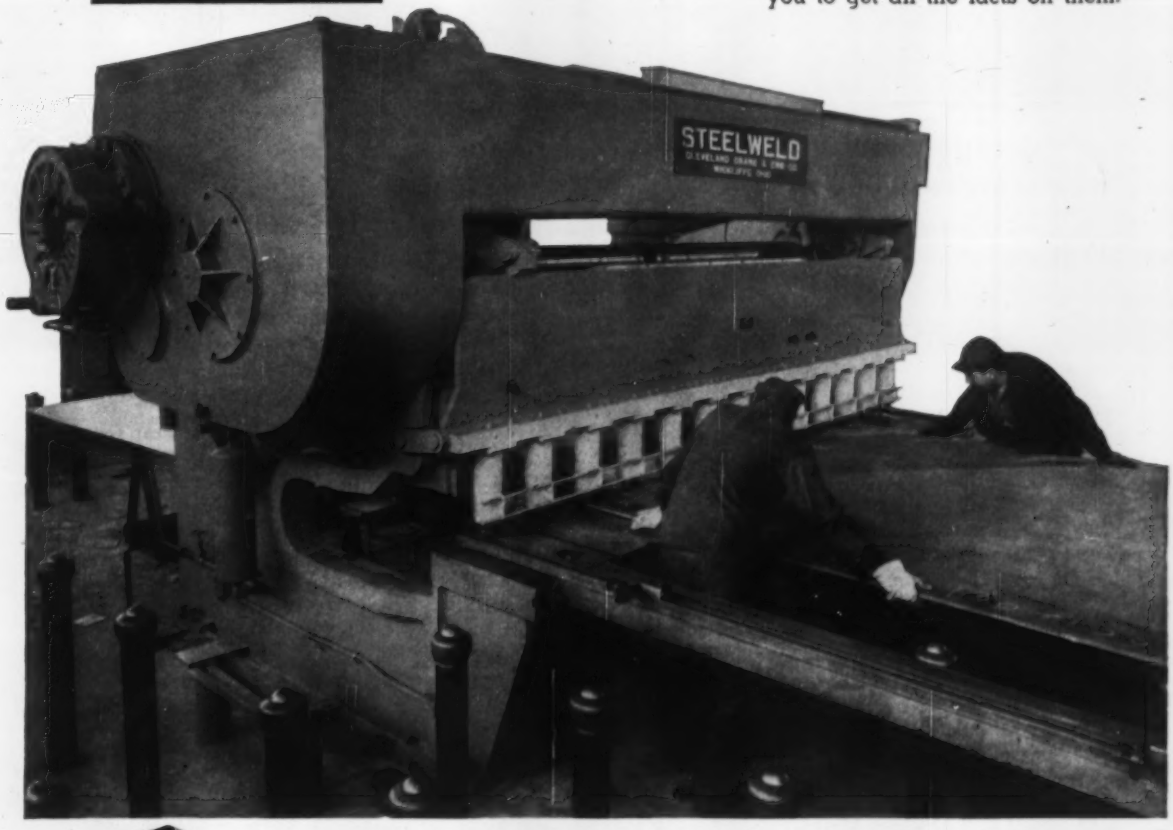
Hot rolled steel plates, stainless plates, floor plates and other metals are cut smoothly and accurately. The machine can handle mild steel up to 12'-0" x ¾". The 36" deep throat permits slitting plates 72" wide down the middle for any length.

Because of the Micro-Set knife adjustment, it is quick and easy to properly set the knife clearance to obtain the best possible cut for every thickness. No other shear has this outstanding feature.

It was only after a thorough study of all makes of shears that Follansbee decided upon Steelweld. And it has fully proven up to expectations.

It makes the cuts as desired in metals of various characteristics. It is fast and easy to operate. All parts are readily accessible and the many adjustments provided minimize and simplify maintenance.

Steelweld Shears are the very latest and most modern on the market today with a host of points of superiority. We urge you to get all the facts on them.



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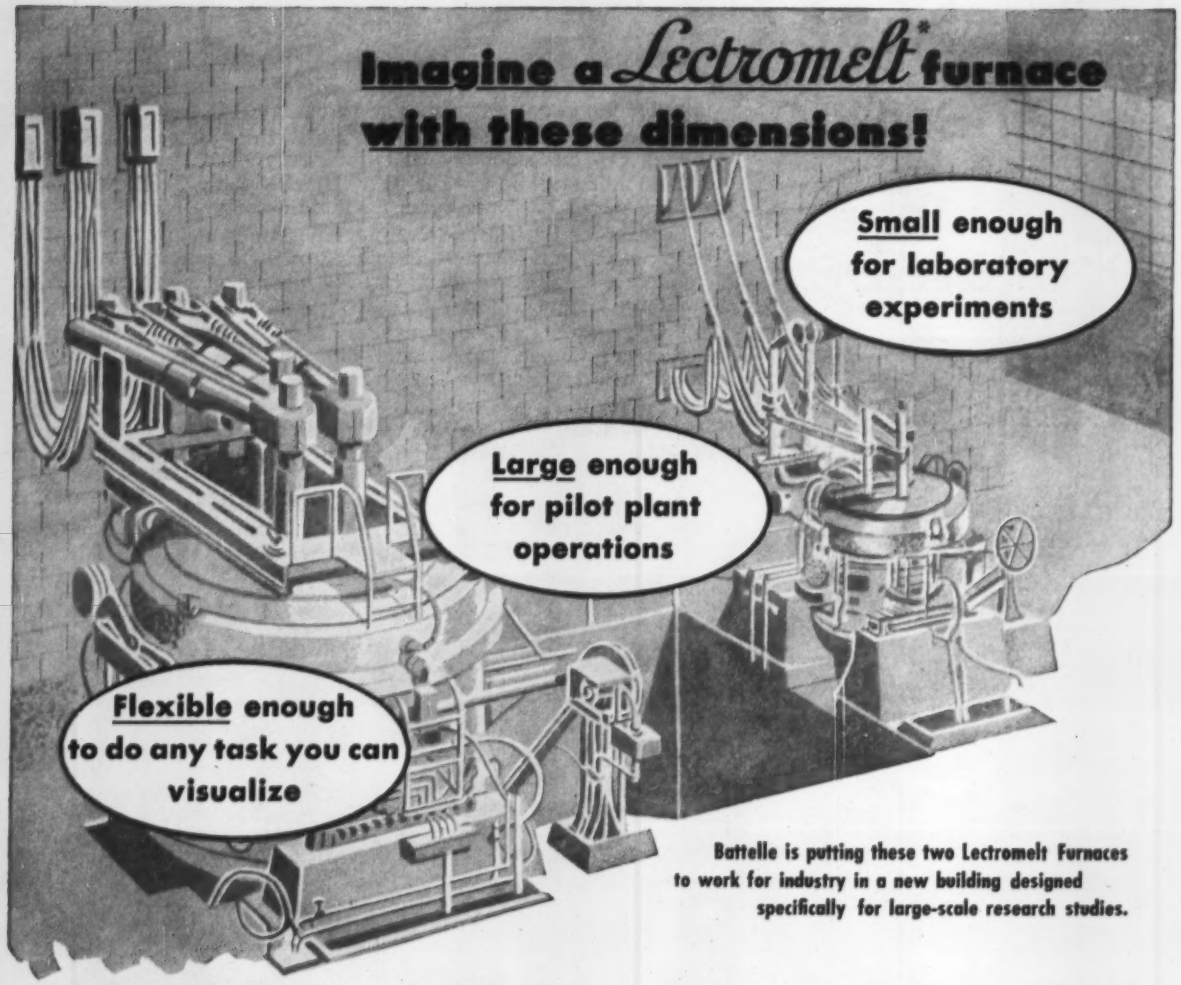
CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7845 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS


Imagine a Lectromelt* furnace with these dimensions!
Small enough for laboratory experiments
Large enough for pilot plant operations
Flexible enough to do any task you can visualize

Battelle is putting these two Lectromelt Furnaces to work for industry in a new building designed specifically for large-scale research studies.

Imaginations were allowed free rein at Battelle Memorial Institute, Columbus, Ohio, and this Lectromelt* Furnace Equipment is the result. Any type of furnace shell can be employed, including a 7-foot, open-top stationary smelting shell, a traveling, rectangular hearth for progressive smelting, or a steel-melting type of 1-ton capacity with 90° nose tilt. All can be operated with or without a roof.

Electrodes can range from four to eight inches in diameter, and can be placed in any configuration—triangular or in-line. 144 possible voltage connections, from 23 to 554 volts, are provided by the oversize furnace transformer.

Battelle is counting on you to put this furnace to work

The scope of metal refining and recovery projects will be widened considerably by the addition of this second Lectromelt Furnace. Two-slag smelting research on methods of recovering metals now wasted is an important possibility. Cheaper scrap for melting . . . how to handle hot metal charges . . . special reduction and melting processes . . . more economical use of the high temperatures developed in electric furnaces—these are typical problems warranting study.

Added knowledge on the physical chemistry of slags will broaden the field of application of electrothermics. Procedures in ferro-alloy production can be analyzed more accurately because of the exact gradations in voltage provided. A cut in calcium carbide costs may result from a search for a method of using a poorer grade of raw materials and a recirculation of calcium oxide sludge.

For a free copy of Lectromelt's Catalog No. 9-A, write Pittsburgh Lectromelt Furnace Corporation, 323 32nd St., Pittsburgh 30, Pa.

*REG. T. M. U. S. PAT. OFF.

WHEN YOU MELT... MOORE RAPID Lectromelt

matic conveyor. This unique feature is designed to simplify and speed handling. The operation is automatic, from loading to finishing.

Virtually any metal can be worked in the new press. It is equipped only for cold-forming, but a new heating furnace under construction will make hot or cold press work possible.

Barry Controls Buys Insco Co.

Barry Controls Inc., Watertown, Mass., acquired Insco Co., Groton, Mass. This marks the first major step in a diversification program for Barry, maker of mounts for the elimination of shock and vibration. Insco makes electromechanical instruments and controls and has done special development work on problems involving measuring, recording, controlling and indicating instruments. Dave Ammen is manager of the Insco Co. Division.

Thomas & Skinner Renamed

Thomas & Skinner Steel Products Co. Inc., Indianapolis, changed its corporate name to Thomas & Skinner Inc. The firm designs, manufactures and applies permanent magnets, electrical stamped steel laminations and tape wound cores.

Spang-Chalfant Opens Branch

National Supply Co.'s Spang-Chalfant Division, Pittsburgh, opened a district office in the Russ building, San Francisco. E. A. Scanlon is district manager.

Resumes Air Conditioner Line

Room air conditioners again are flowing from production lines at Westinghouse Electric Corp.'s Springfield, Mass., plant after 13 years. Under pressure of wartime production, Westinghouse discontinued manufacture of room air conditioners in 1942. The plant, modernized and partly re-equipped, will have an ultimate capacity of 300,000 units a year. Room air conditioners rank fourth in sales among appliances. Retooling at the plant for greater production

(*Please turn to page 94*)

Specify Michigan Tubing for economy and versatility
The ABC of MST
A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS
C AT LOWER COST

A Quality Product

ROUND

¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
⅜" to ¾"	16 thru 22	⅜" minimum side to 5" maximum side
⅞" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

Standard Sizes

Tube Diameter O.D. Size	Maximum Wall Decimal	BWG Gauge	Minimum Wall Decimal	BWG Gauge
⅛	.065	16	.022	24
¼	.083	14	.022	24
⅓	.095	13	.022	24
⅜	.095	13	.022	22
¾	.095	13	.028	22
⅞	.095	13	.028	22
1	.095	13	.028	22
1⅛	.095	13	.028	20
1¼	.095	13	.035	20
1⅜	.095	11	.035	20
1½	.120	11	.035	20
1⅝	.120	11	.035	20
1¾	.120	7	.035	20
1⅞	.180	7	.035	20
2	.180	7	.035	20
2⅛	.180	7	.035	20
2¼	.180	7	.035	20
2⅜	.180	7	.035	20
2½	.180	7	.035	20
2⅝	.180	7	.035	20
2¾	.180	7	.035	19
2⅞	.180	7	.042	19
3	.180	7	.042	19
3⅛	.180	7	.042	19
3¼	.180	7	.042	18
3⅜	.180	7	.049	18
3½	.180	7	.049	18
3⅝	.180	7	.049	18
3¾	.180	7	.049	18
3⅞	.180			
4				

For almost 40 years

Michigan has been manufacturing tubular parts for leading manufacturers. This acceptance of Michigan tubing has been won by meticulous attention to customer requirements and the supplying of the very best in tubing. The following advantages of low cost manufacture and utmost dependability are yours when you specify Michigan for tubular parts in the fabrication of your products:

1. It is fabricated in round, square and rectangular shapes, in a wide range of sizes;
2. It is always of uniform strength, weight, ductility and weldability;
3. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted and rolled.
4. It can be formed or machined in your plant or prefabricated at Michigan.

Consult Michigan for engineering and technical help in the selection of tubing best suited to your needs.

Michigan RESISTANCE WELDED STEEL TUBING STEEL TUBE PRODUCTS CO.
THE OLDEST NAME IN ELECTRIC

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BAY STATE MOUNTED WHEELS & POINTS

These "WHEELS of PROGRESS" are establishing outstanding records of achievement and dependability.

They are uniform in density and hardness.

All shaped points are trued to exact size and shape *after* mounting on spindle, positive test of ability to hold to spindle . . . run-outs can't occur . . . ready for action, dressing before using not required.

Deep knurling for extra safety, in high strength alloy steel spindles and special adhesive . . . the abrasive heads stay on spindles.

Longer useful life . . . can be used right down to the spindle.

A wide range of shapes and specifications available for immediate shipment from distributor and/or warehouse stocks.

Call on your local BAY STATE DISTRIBUTOR, he's a key man on all grinding problems.

This New Mounted Point Handbook is packed with information about BAY STATE Mounted Wheels and Points, including bonds, lubricant treatments, etc. Send for your copy today.

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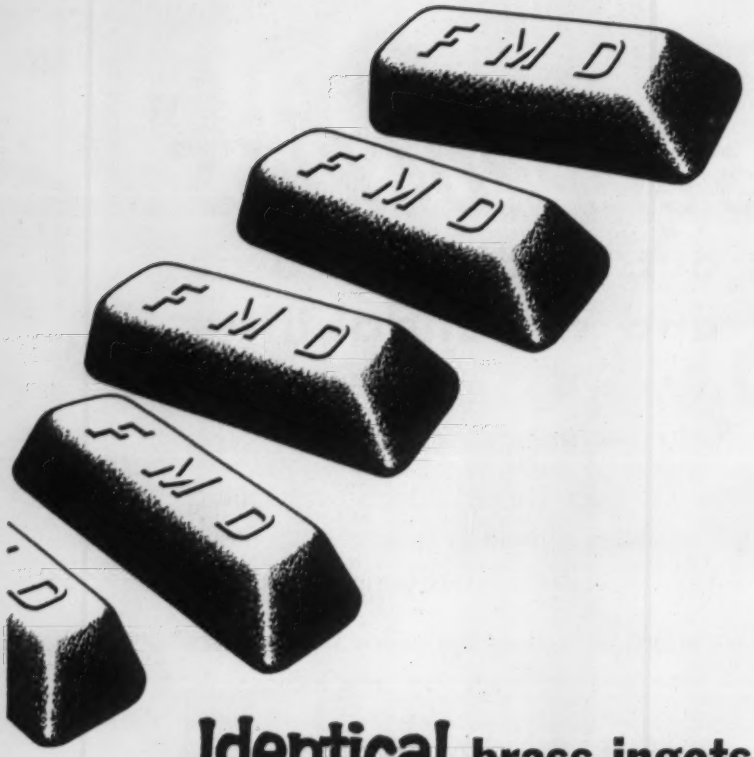
WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO.,
Westboro, Mass., U.S.A.

Branch Offices and Warehouses — Bristol, Conn.; Chicago, Ill.; Cleveland, Ohio; Detroit, Mich.; Pittsburgh, Pa.
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

Manufacturers of all types of Quality Abrasive Products



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now . . . or a year from now

Your order for specification brass today and your order for the same brass a year from now will be identical. Every heat of brass that Federated pours is carefully and repeatedly analyzed. Quality control at Federated is not just an occasional check, but is a regular step in every phase of our production program.

If your castings are hard to pour, or if they are designed for difficult, specialized service, this quality control is important to your customers. They must know that every order you fill will be identical so that they can buy from you with complete confidence.

Federated has a foundry service organization that can help you with any casting problems. Experts who know the cause of casting failures are available to visit your foundry and make corrective suggestions. And backing up these experienced servicemen is a complete, modern, non-ferrous metals laboratory that can trace the cause of trouble right back to its source.

Take advantage of these Federated extras. So many foundries do that we are known as Headquarters for Non-Ferrous Foundry Metals and for technical information on foundry problems. We have 13 plants and 23 sales offices across the country. Any of them will be pleased to help you.

Federated Metals

DIVISION OF AMERICAN SMELTING AND REFINING COMPANY
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Aluminum, Anodes, Babbitts, Brass, Bronze, Die Casting Metals, Lead and Lead Products, Magnesium, Solders, Type Metals, Zinc Dust

(*Concluded from page* 91)

of soft drink bottle dispensers, dehumidifiers and water coolers is scheduled for completion late this year.

REPRESENTATIVES

Cushman Chuck Co., Hartford, Conn., appointed Pearce-Dengel Tool Co., Hasbrouck Heights, N. J., sales representative. C. B. Kopecky was transferred to Syracuse, N. Y., and will represent the company in the upper New York state territory. Cushman makes chucks, power wrenches and face plate jaws.

Copes-Vulcan Division, Continental Foundry & Machine Co., Erie, Pa., appointed Dickey Engineering, Knoxville, Tenn., as representative for its products in that territory.

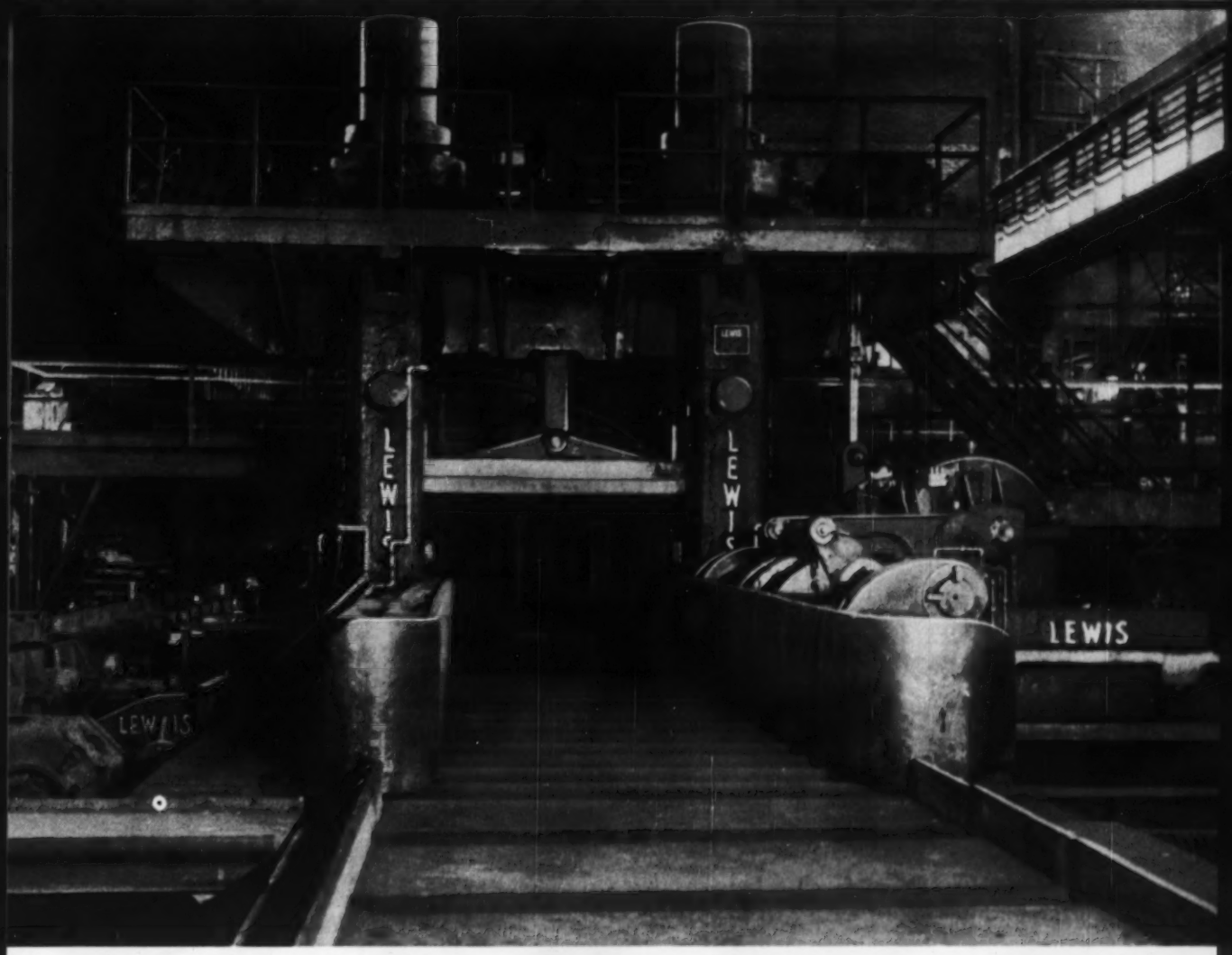
Wilson-Marsh Co., New York, was appointed representative for mill products by **Quaker State Metals Co.**, Lancaster, Pa. Quaker State Metals' new rolling mill is producing 2S and 3S aluminum sheet and coils in a range of thicknesses from 0.014 to 0.051-in., and in widths up to 36 in.

Metal Stamping Division of Dickey-Grabler Co., Cleveland, appointed A. H. Embler and Earl Moore as representatives in the Michigan area. Offices of A. H. Embler & Associates are at 2405 W. McNichols Road, Detroit 21, Mich.

U. S. Steel Corp.'s National Tube Division, Pittsburgh, appointed T. D. Brissman special representative, oil and gas industry, with headquarters in New York.

Moore Bros. Electrical Co., Flint, Mich., has been named a distributor for **Allis - Chalmers Mfg. Co.'s** motors, controls, transformers and V-belt drive equipment.

Harry Standefer was appointed San Diego, Calif., sales representative for **Dudley Steel Corp.**, Los Angeles.



...roughing mill used in production of all standard structural shapes

This 36″ x 82″ Lewis two-high Hot Reversing Roughing Mill was designed and built for use in the production of standard structural shapes.

Although the rolls used in the mill are 36″ pitch diameter and 82″ body length, the large diameter collars needed for beam sections required windows 54″ wide—which is equivalent to those in the usual 44″ to 46″ mill. The cross sections of the sturdy housing posts are 425 square inches.

The mill is equipped with front and back mill tables, which have rack type side guard manipulators 28½″ high for handling the heavy beam blanks that come from a primary blooming mill. Six lifting fingers are provided on the one side guard on each side of the mill.

Driven by a 6300 hp, dc motor, this Lewis Mill can be reversed from 69 rpm forward to 69 rpm in the opposite direction in about two seconds.

Whether you may need a roughing mill of this type or some other kind of mill, our experienced engineers and modern manufacturing facilities are always available to design and build sturdy mill equipment to meet your specific requirements.

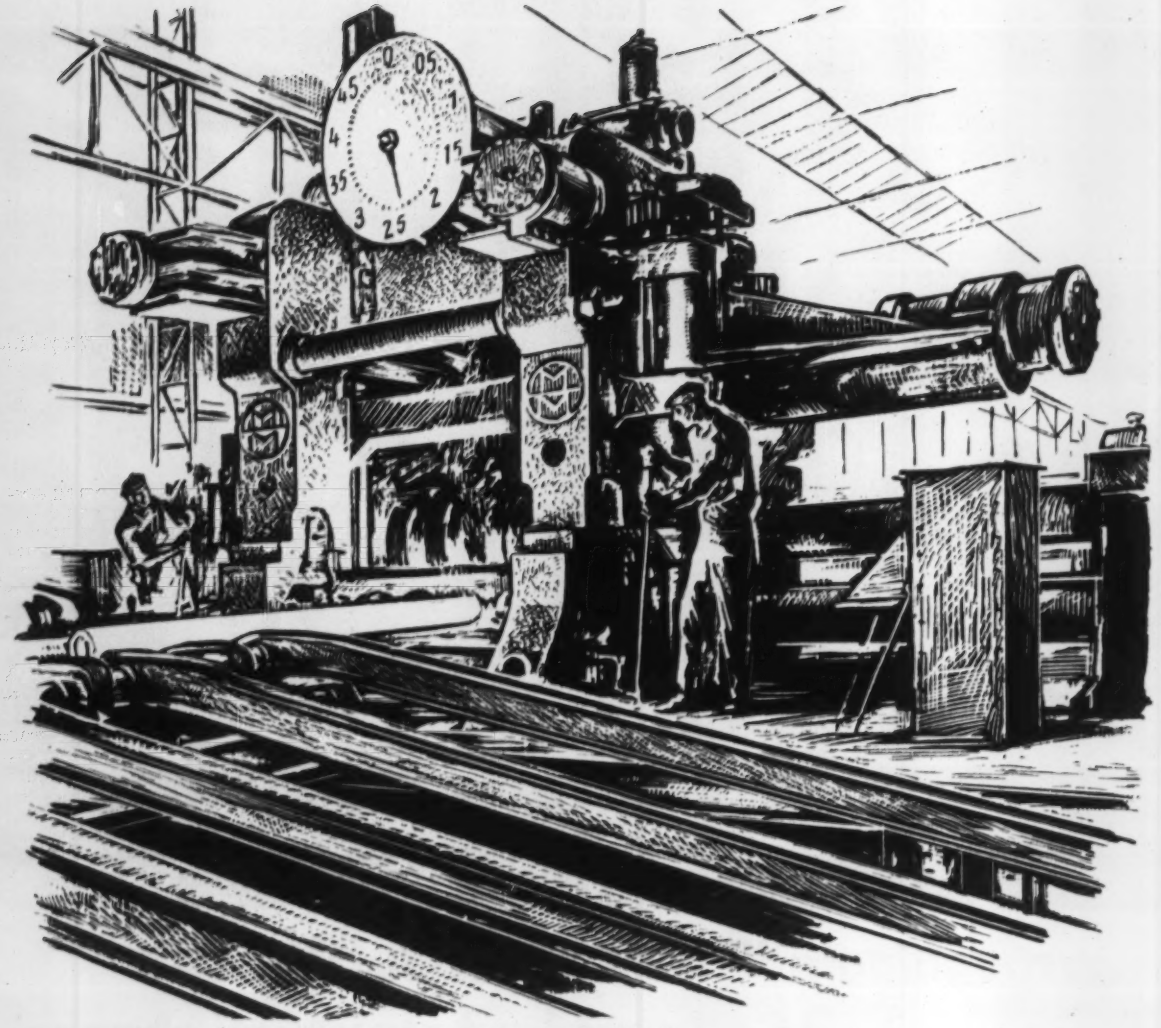
BLAW-KNOX COMPANY

LEWIS MACHINERY DIVISION PITTSBURGH 30, PENNSYLVANIA

BLAW-KNOX

LEWIS two-high Hot Reversing Roughing Mill

LEWIS PRODUCTS: Two-High Mills • Three-High Mills • Four-High Mills • Strip Mills • Bar, Billet and Structural Mills • Plate Mills • Rod Mills • Coilers • Tables • Shears • Pinion Stands • Gear Drives • Roll Lathes



More and Better Seamless Pipe from Newest Automatic Mills

High operating rates of more than 3 pieces per minute of 45 feet long seamless pipe are attainable with Mannesmann-Meer's latest automatic plug mill design.

Besides this high production capacity, new and outstanding developments in mill and mandrel bed design feature extremely quick schedule changeover to cut costly downtime.

More than 65 years of unmatched experience in mill operation and mill design puts us into a position to offer you a combination of

- CREATIVE ENGINEERING
- DESIGN EXPERIENCE
- OPERATING BACKGROUND
- AMERICAN MANUFACTURING SKILL

which is nowhere else ready to go to work for you.

MANNESMANN-MEER

ENGINEERING AND CONSTRUCTION COMPANY, 900 LINE STREET, EASTON, PENNA

WORLD SPECIALISTS IN HIGH-SPEED TUBE MILL MACHINERY

STEEL

September 12, 1955

Technical Outlook

GROWING TOOL—Since 1930 the use of x-ray analysis as a research tool has doubled every five years, a nationwide survey shows. Among fields of investigation: Industrial dusts, plastics, greases, corrosion products, metal phases, ores, alloys, slags, gases.

BOWS OUT—The Atomic Energy Commission will no longer process and distribute cyclotron-produced radioisotopes. Reason: Competition with private industry. The AEC will continue to distribute reactor-produced materials.

AHEAD FOR SILICON—Du Pont's prediction of things to come from silicon: Replacement of gear reduction systems by direct-current electric motors containing small silicon power rectifiers or power transistors; sizable reduction in the weight of electronic gear aboard ships and aircraft; silicon devices to help cars more effectively meet demands of power steering, power brakes and air conditioning.

BRIGHT FUTURE—A mirror finish stainless wire requires no plating, coating or polishing. For most applications, the cost is no more than ordinary stainless wire. The wire can be drawn from 0.030 to 0.090 in. and has a maximum tensile strength of 250,000 psi. It is not diamond drawn.

QUICK COLOR—A set of pressure spray cans filled with different colored lacquers is just the thing for quick identification marking of metals, thinks a paint maker. He has developed a handy kit, complete with stencils.

TRACERS TO THE RESCUE—When the Great Lakes ore freighter *J. S. Ashley* ran into trouble with oil collecting in the boiler feed water filter, the leak had to be detected fast. Without taking the ship out of service, a Tracerlab engineer introduced radioactive iodine into the engine crankcase. Several hours later, while the ship was en route to her next port, traces of the oil were found again on the filter, this time with a Geiger counter! With the leak detected, fixing it was easy.

DRY LUBRICANT—The Navy finds that Teflon coatings make an excellent, long-lasting, dry lubricant. The polytetrafluoroethylene plastic film, better known as a preservative for metals in storage, imparts almost indefinite satisfactory lubrication to small arms, field tests show.

QUICKER CARBIDES—A resistance furnace method for direct casting tungsten carbides does away with powder pressing and sintering steps. The furnace employs three nesting graphite crucibles from which carbon is picked up by the tungsten powder charge. It can reach 8000°F and melt 24 lb of tungsten powder in 3 minutes. Casting is in a centrifugal mold.

SOUND STUDY—Noise has the attention of heating and air-conditioning engineers. They want a noise yardstick more adequate than decibels—one keyed to loudness as noted by the human ear that considers the variation of sound in different directions. Coincidentally, the American Standards Association has announced a standard for sound and vibration analyzers.

PROTECTED SKIN—Electrolytic corrosion of aluminum jacketing on sweating pipes is being stopped by a moisture barrier of kraft paper and polyethylene between the insulation and the skin. The barrier remains flexible at −70°F and withstands +350°F successfully.

Metalworking Outlook—p. 51 *Market Outlook—p. 139*

Heat Treating Ti-6Al-4V—Typical Results

Solution Treatment		Quench	Aging Treatment		Section size	Physical Properties			
						Ultimate tensile strength	Yield strength (0.2 per cent)	Elongation per cent	Reduction in area
Temp. °F	Time hr		Temp. °F	Time hr	in.	psi	psi	in 2 in.	per cent
1100	2	(anneal)				139,000	135,000	16	51
1300	2	(anneal)				137,000	132,000	15	47
1550	1	water	900	24	0.50	165,000	155,000	15	47
1550	1	water	1000	24	1.25	146,000	142,000	22	53
1550	1	water	1000	24	3.75	136,000	127,000	21	43 (edge)
						138,000	128,000	19	42 (center)
1750	1	water	1000	24	0.50	159,000	150,000	13	35
1750	1	water	1000	24	1.00	150,000	144,000	16	32
1750	1	water	1000	24	3.00	143,000	137,000	17	47 (edge)
						137,000	130,000	15	28 (center)
1750	1	NaOH	1100	2	0.75	160,000	153,000	14	48
1750	1	air	1100	2	0.75	140,000	129,000	16	44
1750	1	NaOH	1100	2	4.50	140,000	130,000	15	37
1750	1	water	1100	2	4.50	139,000	131,000	16	42

Ready: Heat Treatable Titanium

Users of the metal are beginning to specify higher strength treatments. Here's how you can get the most out of one of the new alpha-beta alloys, Ti-6Al-4V

By R. G. SHERMAN and H. D. KESSLER
Technical Department
Titanium Metals Corp. of America
Henderson, Nev

AVAILABLE for little more than a year, Ti-6Al-4V already is one of the most important titanium alloys. It's heat treatable.

Developed under government sponsorship by Armour Research Foundation, the alloy has high strength, good ductility and excellent elevated temperature strength and stability under stress at temperatures to 1000° F.

Other commercial alhpa-beta alloys offer heat treatability and excellent tensile properties, but their use is generally limited to below 600° F.

Opportunity Knocks — Users have taken little advantage of the high strengths possible through heat treatment of alpha-beta alloys. It has been general practice to apply them in the stabilized annealed condition in which they were received.

Now that more is known about the physical metallurgy of these alloys, airframe and engine producers are beginning to include higher strength treatments in their designs for certain parts.

Duplex a Must—To obtain moderately high strength levels with Ti-6Al-4V in sections under 1½-in. thick, heat treatments somewhat similar to those for aluminum must be used.

In solution treatment, titanium alloys are heated in a two-phase alpha-beta field, and are rapidly

cooled to room temperature. Subsequent hardening on aging results from the partial decomposition of the beta phase and the precipitation of alpha (both of these phases being terminal solid solutions).

Unstable Beta—Upon quenching from high in the alpha-beta field, a supersaturated beta solid solution results. This beta is unstable on reheating at low temperatures but will not decompose at room temperature.

If heated for long times at 600 to 900° F, the metal will age but low ductility will result. Generally, aging temperatures between 900 and 1200° F from 2 to 24 hours give the best combination of properties.

Choose Alpha-Beta — Solution treatments are carried out in the alpha-beta rather than in the beta field for two main reasons: 1. When the beta transus (beta/alpha plus beta transition temperature) of about 1825° F is approached, ductilities drop off to low values and grain growth proceeds at a high rate. 2. The leaner beta formed near the transus temperature is extremely unstable and ages during the quench, even in small sections.

Despite this aging, excellent combinations of strength and ductility are available at temperatures to 1750° F. At higher temperatures, the ductility drops off and the general advantages of solution treatment are lost.

Forging Temperatures — The same principles apply to the selection of forging temperatures. Temperatures no higher than 1750° F should be used in finish forging, although 1900° F or higher is used in forging ingots and heavy billets. Because these high temperatures do not give optimum properties, lower temperature working, combined with heavy reductions, are subsequently used to restore good ductility.

The lower limit of forging temperature is strictly an economic consideration of the rate at which the metal can be formed. Temperatures down to 1400° F have been used to advantage where sufficient power was available in the hammers to deform the metal, which is stiff at this temperature.

Maximum and Minimum — The 1750° F (1 hour) water quench treatment results in the best combination of as-quenched properties. Yield, tensile and fracture strengths and ductility are at a peak (Figs. 1, 3).

The 1550°F (1 hour) water quench treatment produces a minimum yield-tensile ratio of 0.7 (The yield strength drops to about 100,000 psi, while the tensile strength is above 140,000 psi). The reason for this minimum is not known, but it is fairly certain

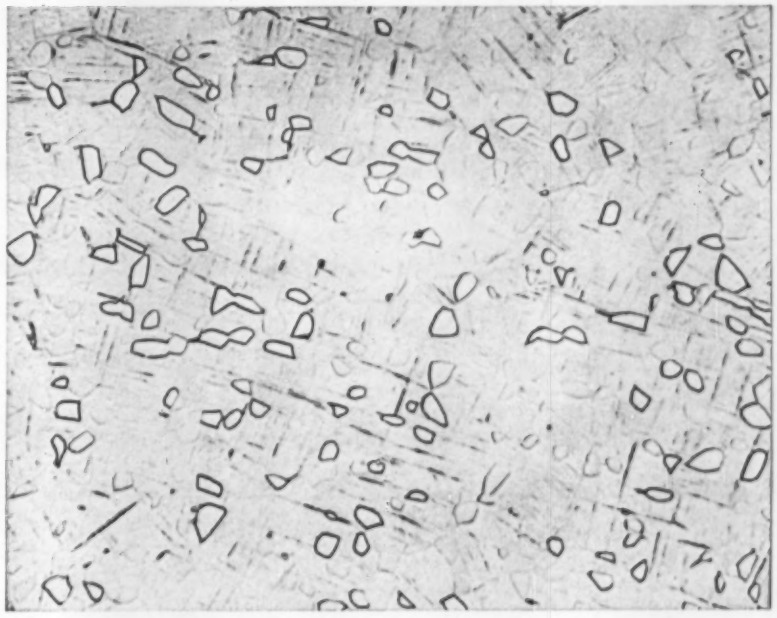


Fig. 1—Ti-6Al-4V after 1750°F (1 hour) solution heat treatment and water quench, giving a small amount of primary alpha in transformed beta matrix. Physical properties are at a maximum. X700

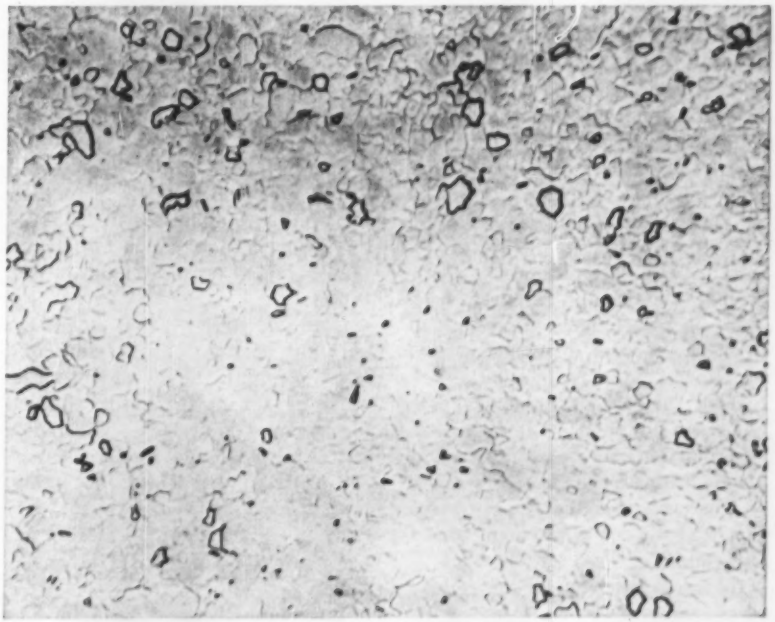


Fig. 2—Ti-6Al-4V after 1550°F (1 hour) solution heat treatment and water quench, giving fine grained alpha, plus retained beta structure. Yield-tensile ratio is at a minimum for best workability. X700

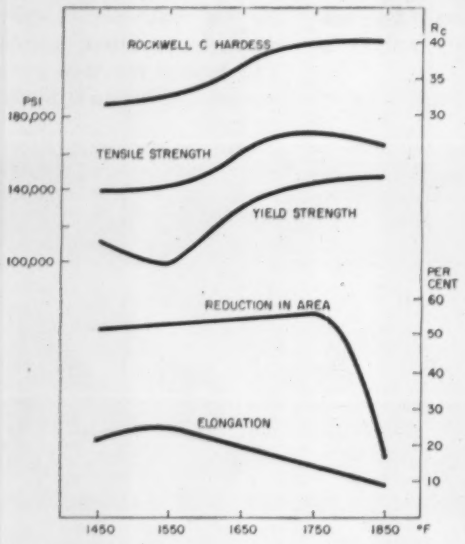


Fig. 3—Effect of solution temperature on mechanical properties of Ti-6Al-4V

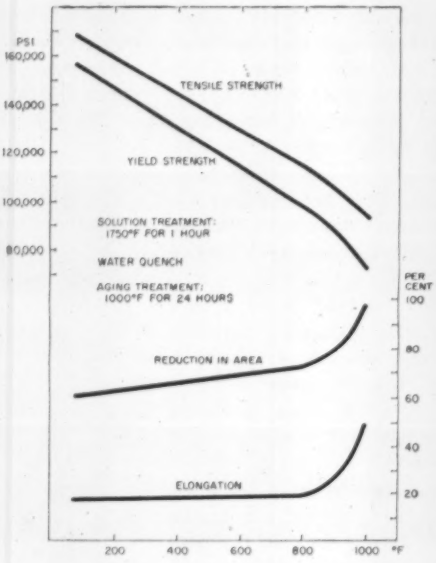


Fig. 4—Elevated temperature properties of Ti-6Al-4V

that composition of the beta is the governing factor (Figs. 2, 3).

Workability — The low-yield-strength, soft material offers the advantages of good machinability and excellent cold formability. Following machining or forming, it can be aged to higher strength by the proper combination of temperature and time. It should not be used at elevated temperatures as solution treated, because in this condition it is unstable.

Response to aging is rapid at 900°F, following the 1550°F (1 hour) WQ treatment. Peak strength is reached in ½-hour or less. For longer times, the strength remains essentially constant.

Fast Quench—Rate of quenching from the solution temperature is important in developing good tensile properties. A fast quench is necessary for maximum retention of beta for subsequent aging (see table).

In small sections, an extremely fast quench in a sodium hydroxide solution or a somewhat slower quench in water shows considerable strength advantage (after aging) over air cooling. (During the air cooling cycle, decomposition of the beta phase renders the alloy less heat treatable.) In heavy sections, the sodium hydroxide quench offers no strength advantage over water quenching. Little, if any, age hardening can be obtained after furnace cooling from the solution treating temperatures (see table).

Section Size—Duplex heat treatment produces higher strengths for section thicknesses up to 1½-in. Beyond that, it has no advantage over the straight anneal (see table).

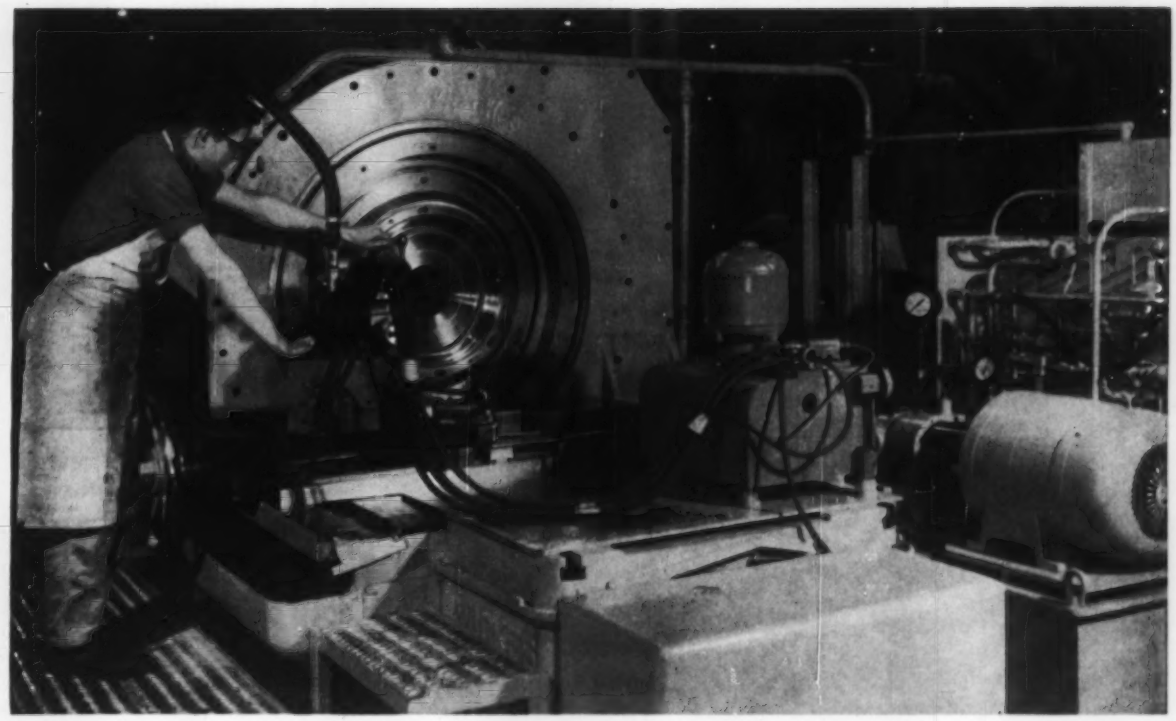
Core strength varies inversely with the section. To obtain a desired strength level, section size must be considered before selecting the heat treatment. The 1550°F treatment should produce greater depth of hardening or aging than the 1750°F treatment, because the richer beta existing at the lower temperature is more stable.

Strong in Stress—One main advantage of Ti-6A1-4V is its stability under stress at elevated temperatures. For example, compressor blade specimens stressed to 50,000 psi at 800°F for 1000 hours and then tensile tested show no embrittlement.

The test sometimes results in an increase in tensile strength, with little or no loss in ductility. Deformations resulting from the test conditions correlate with tensile strength, indicating that heat treatment has an effect upon short-time creep (Fig. 4).

Aging Temperature — Although duplex heat treatment offers better elevated temperature strength without embrittlement, aging temperature should be higher than the service temperature. Aging should be on the order of 24 hours for greatest stability.

Temperatures below 900°F should be avoided because service at temperatures as low as 600°F could cause further aging and possible embrittlement. Aging treatments of 900 to 1000°F for 24 hours following either a 1550°F (1 hour) WQ or 1750°F (1 hour) WQ offer sufficient stability to render excellent service without danger of embrittlement at temperatures to 800°F.



Opposed tooling on this converted center-drive lathe means . . .

Distortion Gone from Disc Contouring

PROBLEM: Design a machine tool capable of simultaneously turning both sides of a J-57 compressor disc.

Solution: Convert a center-drive lathe formerly used to machine piston engine crankshafts.

Why—Compressor discs for the J-57 jet engine (there are 16 in each) are critical parts to machine. At one point the stainless steel narrows to a thin $\frac{1}{8}$-in.

Using ordinary T-lathes, the discs have a tendency to "dish" if too much tool pressure is applied. Processing time is high because each disc must be turned at least six times during the finish contouring, and scrap is unavoidably out of proportion.

Where — Thompson Products, Pratt & Whitney Aircraft (designer of the J-57) and the Ford Aircraft Engine Division all experienced the same troubles in attempting to machine the discs. Ford turned the problem over to its semi-production department for solution.

Production equipment designers envisioned a machine embodying the principles of two T-lathes head to head, with a center-drive feature to permit simultaneous machining on both sides of the disc. Obsolete machine tools, still in the division from the completed piston engine program, were examined and a Wickes center-drive, crankshaft lathe, which cost $78,000 new, was chosen.

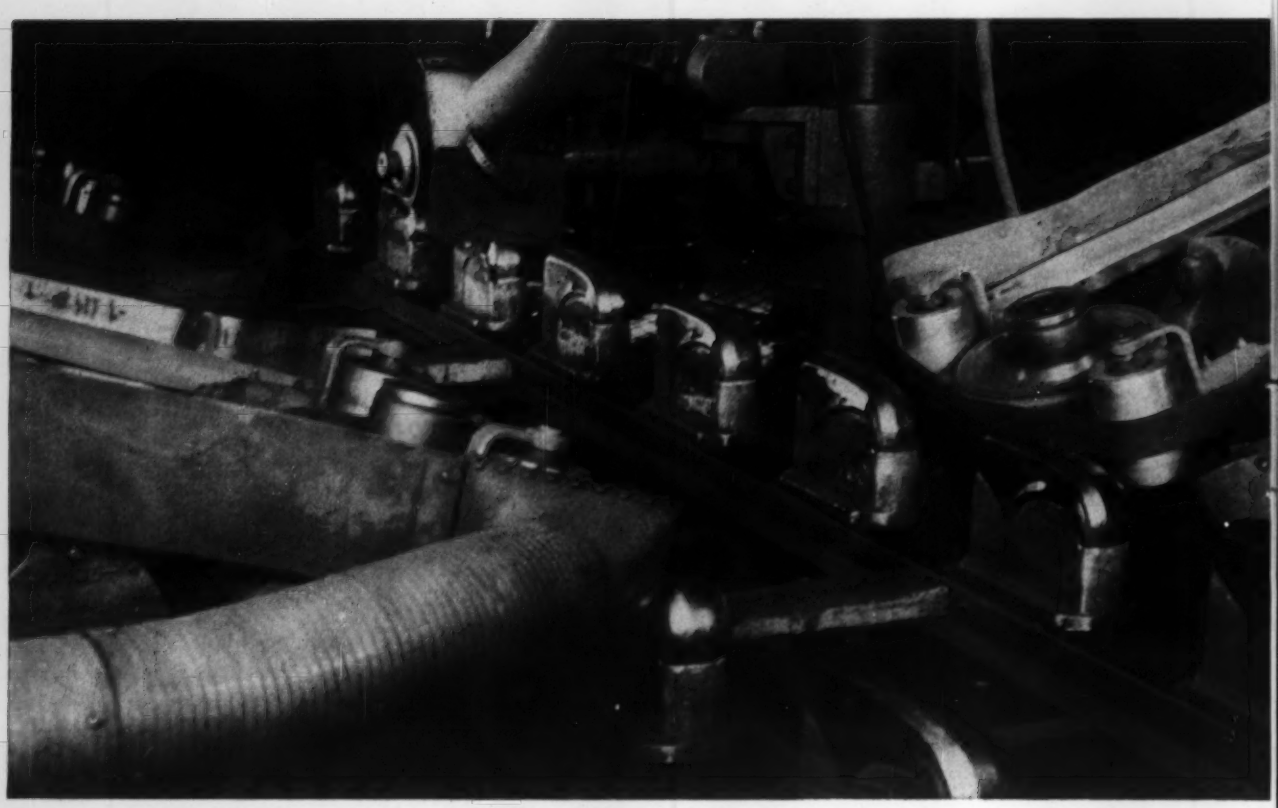
How—The lathe was stripped to its base, retaining only the center-drive feature. New ways and carriages were installed, a hydraulic tracing unit was added and different feed mechanisms with proper ratios were built in. Spindles, speeds, tooling provisions and coolants were revised and adapted.

Slightly more than five months from the time design layout was begun, the machine was ready for its first run.

New Look—As the contour finishing machine now looks, it bears little resemblance to the original lathe. Tools work opposite each other at all times, eliminating the "dish" and other distortion problems formerly encountered in single face contouring.

Setup time has been decreased 75 per cent, output has doubled, quality has improved and scrap losses are negligible.

Other machines turn the outside diameter on the rough disc forging and face two flanges. The new tool does rough and finish contour turning. The disc goes to other machines for finish boring and flange finishing.



Belts spot-grind bumper guards as they move through the line. Guards go down one side of the line—back the other

Abrasive Belt Polishing

By LEE VORCE
Regional Product Engineer
Behr-Manning Division, Norton Co.
Detroit

PART II

LINE-AND-STATION polishing is the product of two developments of the last 20 years. First, the emergence of modern coated abrasive belts and the know-how of contact wheel selection and belt lubrication (see STEEL, Sept. 5, p. 86). Second, the trend toward automatic machinery for work handling and processing.

Line-and-station polishing didn't take root until after 1939. The so-called semiautomatics which hold and articulate workpieces in front of a polishing jack predate 1940 a few years.

Lines—Coated abrasive polishing lines are classified as continuous or indexing. They may be straight line, horizontal return (down and back), ferris wheel or rotary table.

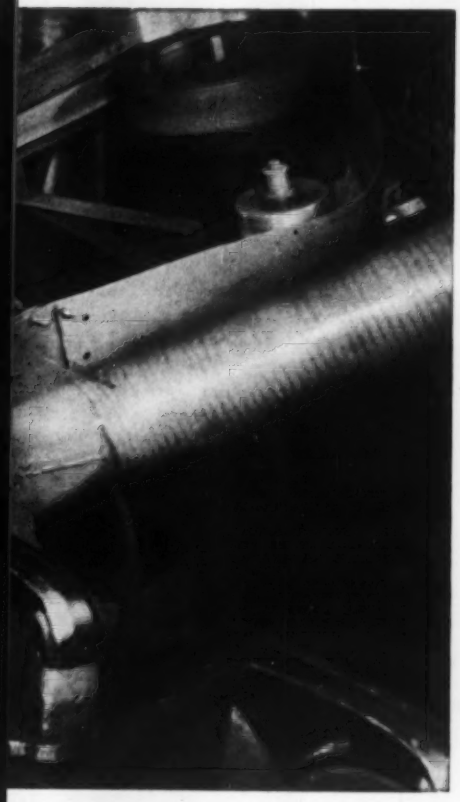
Continuous straight-line and horizontal-return lines are in almost universal use to polish bumper guards and other contour parts for autos in Detroit and its satellite areas.

Indexing rotary-table lines are common for polishing fittings, appliance housings, hardware items, screw machine parts, castings, stampings and other small workpieces. Semiautomatic arrangements are used where the number of stations are few (one or two), parts to be polished are relatively small, floor space is at a premium and a horizontal axis for the work-holding fixture is desired. Bicycle hubs and flanged cylindrical objects frequently are polished in this fashion.

In all cases, the operator merely loads and unloads workpieces on fixtures as they pass.

Both mechanical and pneumatic drive systems are used on lines where parts are indexed from station to station. Pass along is included as a type of indexed line motion for production where work transport is by bin or hand-loaded conveyor, and an operator manipulates the workpiece or polishing head during processing.

Stations—Polishing units may



be classified by type of polishing head, by type of fixture and by type of contact between the belt and workpiece.

The station (head) may be a driven contact wheel with back-stand idler, in which case the equipment is called a lathe or jack. It may have fixed or variable speed. The head also can be a "belt head" in which the driven spindle is behind an idling contact wheel, and the belt is tensioned by springs, pneumatic cylinders or threaded members between drive pulley and contact wheel. Belt heads may have one, two, three or even four idler pulleys in addition to the drive.

Or the head might be: A yoke sander (the term describes the support of the spindle of the contact wheel over which the belt runs); a coated abrasive disc; a point (wound cone or ball of coated abrasive strip); a sleeve held on an expanding drum; a wide belt running over a flat pressure platen or a strapping run in which there is no support behind the belt at the point of contact.

On some new heads the wheel (except for the hub) is made up of folded coated abrasive cloth arranged radially. These are "wearable" wheels which wipe the work hundreds of times at each rotation and are sufficiently soft to permit highly configurated workpieces to be addressed to the head. They permit the elimination of idler contact wheels, mechanism detail, tensioning and head articulation. They are, for all practical purposes, "soft finishing wheels."

This wheel, such as our Kon-Toor model, is adaptable to straight-line, rotary and semiautomatic work. It comes in 2, 4, 6 and 7-in. widths. Purpose: To smooth out the finish.

Wheels are 17-in. in diameter. Speeds generally used are the lower range of 1750 to 2200 rpm.

Fixtures—Fixtures may be stationary work-supporting blocks, rotating spindles, cam-manipulated units which follow a variety of motions or geared fixtures in which a rim of almost any configuration slides on a table between a fixed pin and a sprocket or spur gear.

Pneumatic fixturing is popular for hollow ware. The fixture matches the interior shape of the workpiece. A vacuum draws the workpiece into tight contact with it and holds without slippage during polishing.

Contact — Correct contact between belt and workpiece is important. Mostly it concerns the nature of the contact wheel over which the coated abrasive belt runs and against which the workpiece bears.

The pressure with which the workpiece is pushed into the contact wheel at the point of polishing usually is regulated by dimensional adjustment between fixture and wheelshaft. It can be regulated by pressure mechanisms acting on either the workpiece or the contact wheel. In one straight-line job where a head is to polish only one spot of a passing workpiece, the contact wheel is between two idler pulleys and is thrust forward at timed intervals.

Other classes of belt and workpiece contact are: Strapping with a section of unsupported belt; strapping with a section of belt supported from the rear only by a leather or rubber belt moving at the same speed; working against a hard platen or drum; or (rarely) having the belt slide at the point of workpiece contact around a stationary pin or plate.

Sometimes heads are made by wrapping coated abrasive sheets around mandrels or forms to get shapes and motions not easily obtainable by running belts over contact wheels.

Limits—Close tolerance work in polishing flat surfaces can be done with a platen behind the belt and precise fixture design and manipulation. Sometimes polishing or grinding on opposite flats is done simultaneously, so platens on opposite sides of the workpiece buck each other to regulate both tolerance and belt-work pressure.

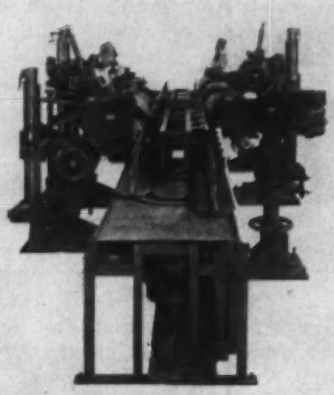
Oscillation of coated abrasive belts laterally across the workpiece is commonly used for any of three purposes: To break up grit lines from a rougher polishing at a prior station, to cover a wide part with a relatively narrow belt or to distribute the wear of a narrow workpiece over the full width of a wider belt. When oscillation is accomplished, the piece, the head or both may be moved by the oscillating mechanism. In practice, 4 in. is about the extent of practical oscillation.

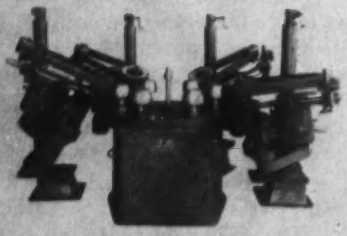
Another contact variation is to allow the head to float. This equalizes the belt pressure over configurated pieces as they pass.

Definition—But contact between abrasive belt and workpiece is more than a matter of pressure and dwell time. It is also a matter of angle of attack on the workpiece, belt surface speed and direction of movement.

The belt should be tight against the contact wheel for a curving distance at least equal to the diameter of the wheel (110 to 120 degrees of arc) before it strikes the work. This insures maximum lateral stability of belt under service. This is why, in off-hand work, back-stand idlers should be floor mounted. In line-and-station work, lateral belt stability under workpiece pressure is equally im-

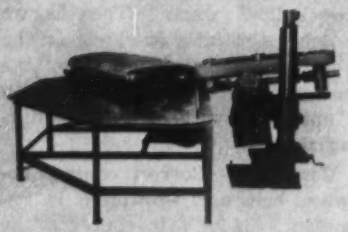
This horizontal-return (looped) line brings the parts down one side, back the other. This line is finishing die-cast drawer pulls

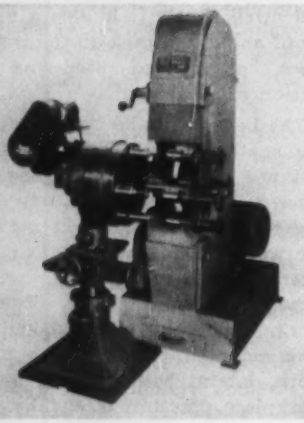




Rotary table for pan-shaped stamping has four belt-processing stations. Two additional stations are used for loading and unloading

Roller chain around fixture meshes with drive sprocket to rotate rectangular workpiece past the belt station. Constant wheel pressure is assured





A semiautomatic fixture rotates in the vertical to present a sequence of wheel hubs to the vertical belt grinder

portant, whatever type of head is used.

Slower belt speeds are the trend. Average speeds range between 4500 and 7000 sfpm. Generally, faster cuts are obtained from these lower speeds. When burnishing effects are needed for fine polishing, higher speeds may show up well.

How To—Direction of belt travel at point of contact is a subject of some debate. When cutting steel, we believe the belt always should travel in the same direction as the workpiece. When working brass and other nonferrous metals, the belt should travel against the workpiece while cutting, *with* the workpiece while polishing.

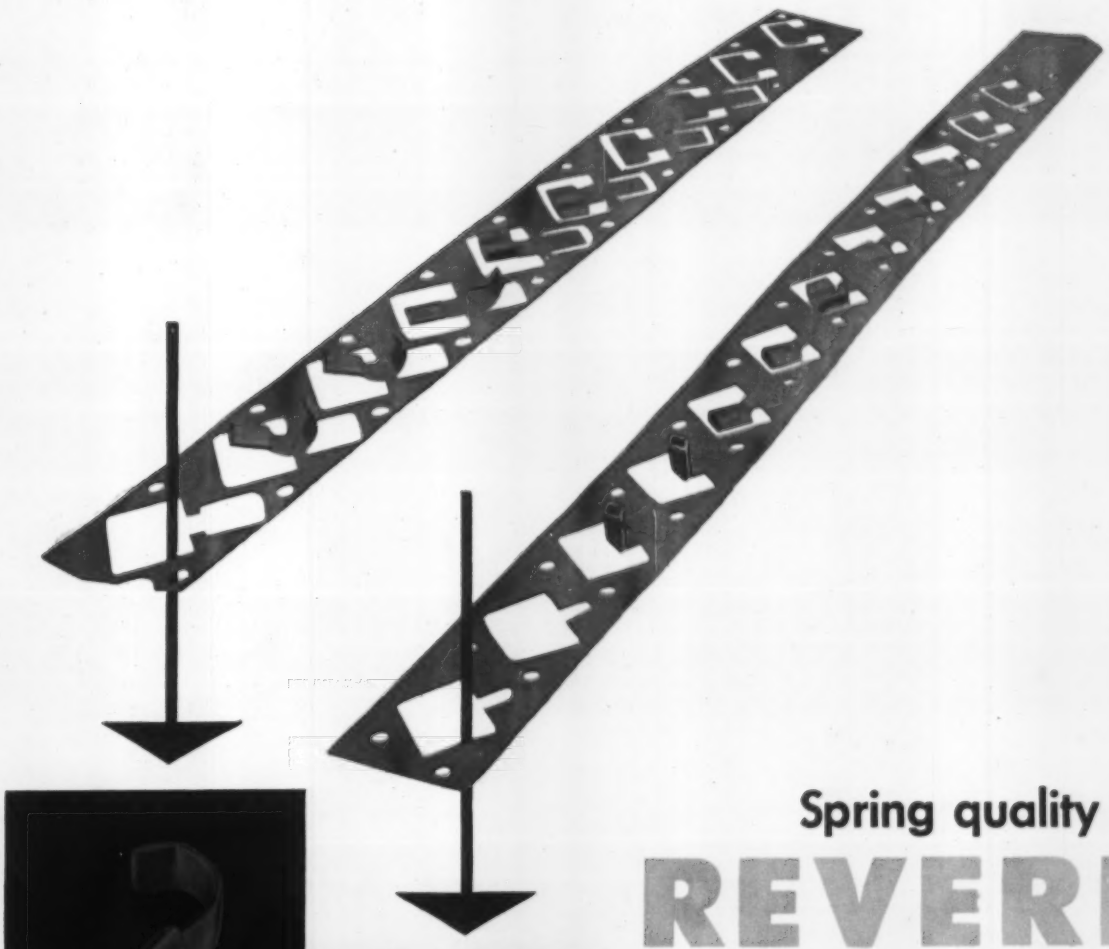
Always strap down so sparks and swarf are carried toward the floor. Another caution with strapping: You must use high crowns on the pulleys on either side of the working area—or automatic means of keeping the belt on track—to guide the belt properly before and after contact with the workpiece.

When the part is being rotated or otherwise moved at the same time that the coated abrasive belt is moving, you'll have to subtract or add the speed of motion of the workpiece to the speed or motion of the belt. In an automatic setup for removing, polishing and buffing the flash from flat circular plastic pieces (3 to 11 in. in diameter), the spindle (fixture) speed is variable from 850 to 1700 rpm. Circumferential speed of the workpiece may be kept constant regardless of part diameter.

Fundamentally, part shape, part material and finishing required, dictate the earliest decisions in incorporating these variable components into a line-and-station polishing setup. The final article next week will discuss these.

This is the second in a series of three articles by Mr. Vorce on abrasive belt polishing. The last installment will appear next week.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*



Two types of Krueger and Hudepohl clips, and strips showing progressive stages in fabrication.

Spring quality of REVERE PHOSPHOR BRONZE makes solderless connections possible

It is not always the case that solder has to be used to make good electrical connections. Often phosphor bronze clips can be used, tightness being achieved through the hard-gripping spring quality of this metal. Take the clips made by Krueger and Hudepohl, Inc., Cincinnati 2, Ohio. This company uses Grade A 5% Revere Phosphor Bronze to make its connections for refrigerators, and for submersible pumps and hydraulic control units. Such services require not only tight permanent connections, but the ability to withstand severe temperature variations, as well as vibration. Revere Phosphor Bronze meets the needs perfectly. In developing this application, the Revere Technical Advisory Service collaborated closely with the customer on the important matter of temper required both for fabrication and end use. Krueger and Hudepohl report no rejects. The metal is supplied in the form of strip, one inch wide, and in very long coils, so that down time for coil set-up on each progressive die machine is minimized. Send for your free copy of "Revere Phosphor Bronze," which provides details about qualities, performance, and applications.

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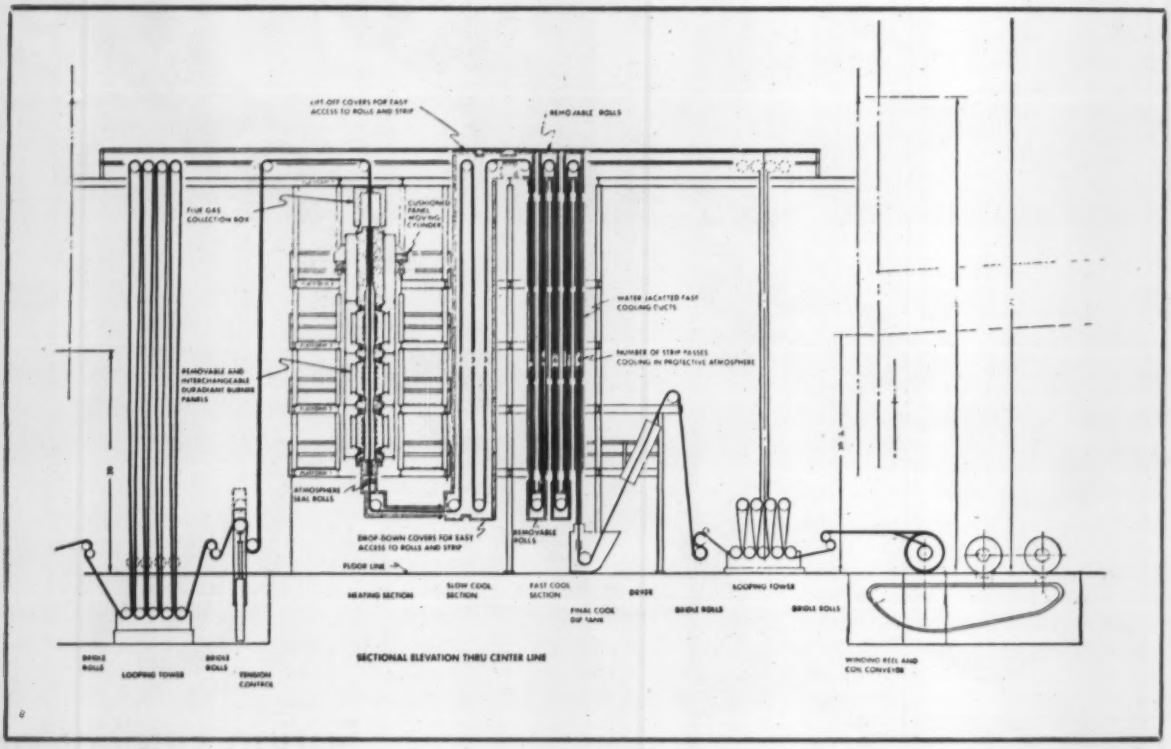


One-Pass Heating Improves Annealing

Design Data

Rated Capacity — 100,000 a year

Operating Range
- Strip width—18 to 44 in.
- Thickness—0.007 to 0.015 in.
- Speed—250 to 500 fpm
- Temperature—heated to 1250 to 1350° F, cooled to 135° F

Typical Cycle at 500 fpm
- Initial strip temperature —70° F
- Heated strip temperature—1250° F
- Cooled strip temperature —135° F
- Preheat and heat to 1250° F . . . 3.1 seconds
- Retarded cooling . . . . . 19.0 seconds
- Fast cooling to 600° F . . . . . 28.1 seconds
- Fast cooling to 135° F . . . . . 2.0 seconds

Dimensions
- Over-all width . . . 23 ft
- Over-all length . . . 180 ft
- Over-all height (furnace-cooling bay) . . . 55 ft
- Over-all height (feed, cleaning and takeoff) . . . . . 24 ft

STRIP for tinplate will be heated in a single pass. Control devices will practically eliminate strip burnout and rethreading problems.

That's what is in store for an eastern mill when several continuous vertical annealing furnaces go into production.

By using direct radiation heating, Selas Corp. of America, Philadelphia, has been able to design a unit capable of the fast, uniform heating required of the single-pass concept. It has paid off in compactness, too.

Not Just Dimensions—The relative compactness also is apparent in the short length of strip in the heating and cooling zone at any time—427 ft. This strip (adjusted to comparable tons per hour) is only a fraction of the length found in conventional lines. This is important because losses in strip and production time following shutdowns are almost proportional to the length involved.

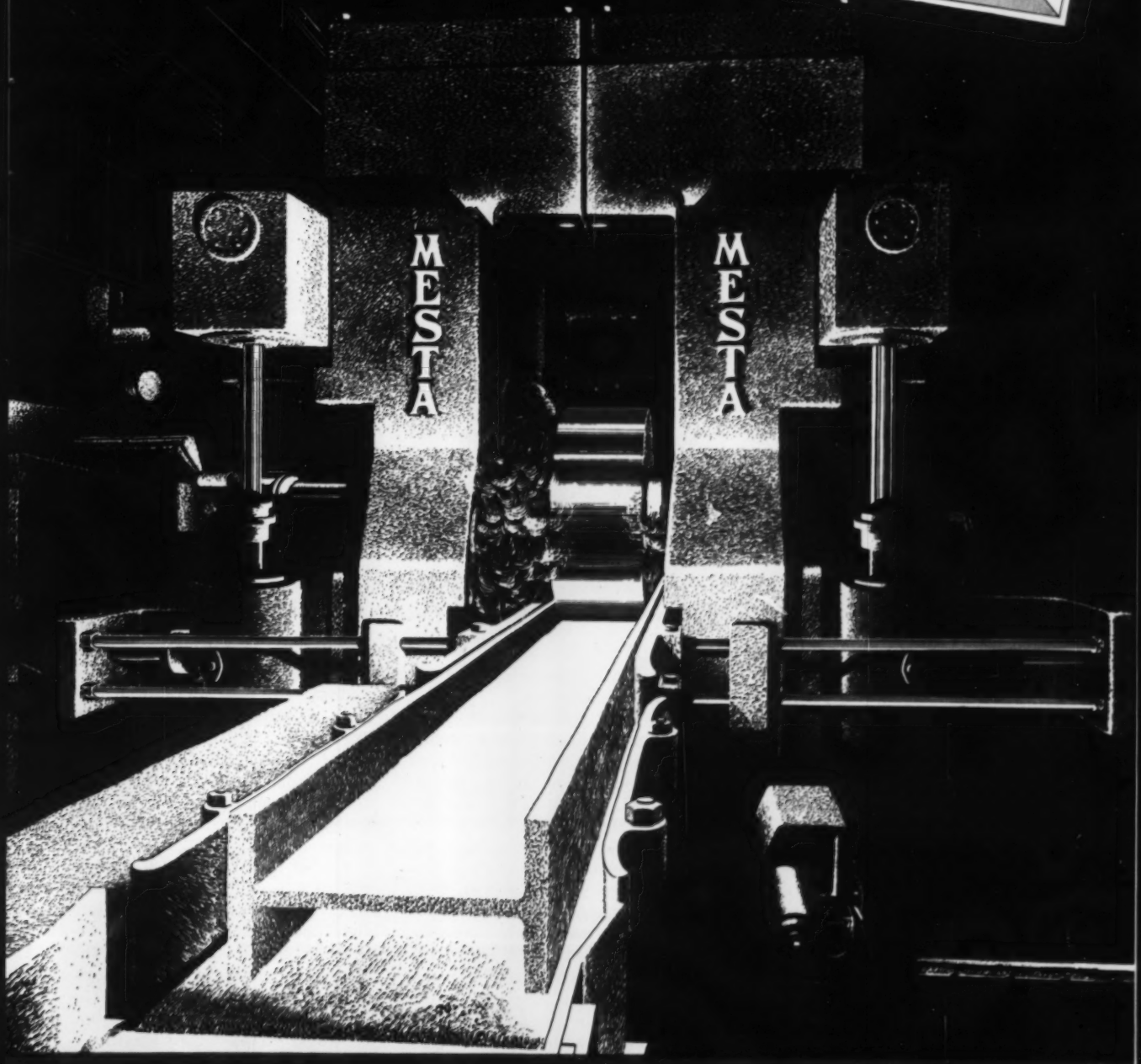
One feature of the furnace design is the removal of heat from the strip smoothly and rapidly in automatic response to line shutdown and the return to normal on the startup. Strip burnout causes like oxidation and overheating are eliminated.

Sensitive Control—The line is versatile and automatically meets changes in gage and width of strip. The fuel flow rate is basically governed by the exit temperature of the strip. Rate and distribution of the heat application are such that uniformity of heating is positive from edge to edge, without the need for manual attention to gages and widths within the design range.

The cooling arrangement, incorporating retarded cooling and fast cooling zones, delivers strip in a minimum number of passes that is stain-free and far cooler than the product of conventional lines. This permits final skin-pass rolling without the long waiting periods generally required for cooling.

WIDE FLANGE BEAM and STRUCTURAL MILLS

Designed and Built by **MESTA**

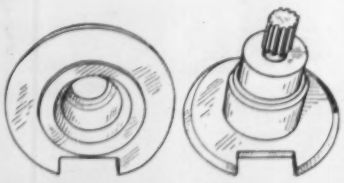


The Universal Mill Stand illustrated above is one of the units comprising the new MESTA Beam Mills being built for the Inland Steel Company, Indiana Harbor Works.

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

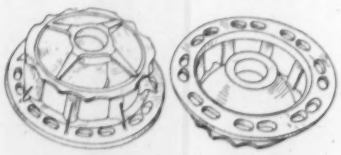
MESTA MACHINE COMPANY • PITTSBURGH, PA.

1



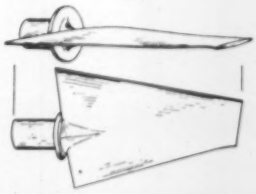
Splined shaft and thrust member—casting eliminates large-scale machining operations

2



Engine heater burner housing—casting solves problems of alignment and concentricity

3



Guided missile stabilizer fin—casting frees forges for other critical work

Three Ways To Save with Frozen Mercury

By DR. IRVIN R. KRAMER
Vice President
Mercast Corp.
New York

WITH LARGE COMPONENTS made by conventional methods, the cost of getting accuracy and finish often rises sharply because of: 1. Large machine tools needed. 2. Great waste of metal in chips. 3. Expensive starting workpiece. 4. Great skill required to meet tolerances. 5. Elaborate jigs and fixtures.

An alternate method, the lost wax process of investment casting, runs into difficulty—castings rarely have sections thicker than ⅜-in., weigh more than a pound or approach 6 in. in any plane. In larger sizes, the use of frozen mercury as a pattern material becomes most significant.

For Big Sizes—The pattern and mold characteristics of the process make it possible to hold tolerances of ±0.003 in. per inch, regardless of section thickness or temperature of melting or casting. Castings weighing up to 100 lb and having dimensions greater than 36 in. are produced with close-to-finish dimensions.

To compare the costs of manufacturing methods accurately, the engineer must compare equivalent stages of completion. The following examples show how frozen mercury stacks up:

Reduce Machining—In a new type radar for guided missile control, a key part that serves as a splined shaft and a thrust member must be made from austenitic stainless steel for proper strength, corrosion resistance and magnetic properties. To produce the part from bar stock, first steps include boring, turning, milling and hobbing. Eighty per cent of the bar is lost in chips.

At this point, the frozen mercury casting can be compared. The cast teeth are ready for use with only the minor foundry cleanup —a few light lathe operations finish critical diameters.

Tool cost, also a factor, rules out forging, upsetting or extrusion. Die costs are 10 to 20 times greater than those of the investment dies. Maintenance and repair are higher, too.

Eliminate Fabrication—An as-cast burner housing for an aircraft engine heater comes from the mold needing only three light facing operations before assembly. Its predecessor component, constructed of a dozen smaller parts, had to undergo a lengthy machining, forming and welding cycle before it reached this stage of production.

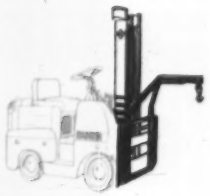
Each of the 12 smaller components was individually machined from heavy plate. Since the alloy was SAE 4630, machining was difficult and welding into a homogeneous unit was more difficult. Turbulence and resistance to air flow were created by variations in the welded structure.

This part, weighing over 5 lb, measures more than 9 in. in diameter. Alignment between planes, concentricity and over-all tolerances are much closer with the cast housing.

Prevent Bottlenecks — During wartime, a stabilizer fin for guided missiles, normally formed from SAE 4130 steel by hot forging and contour milling, might well become a production casting with frozen mercury patterns. The stabilizer fin would be cast close to final shape, including airfoil sections that could otherwise be developed only by contour milling a forged blank.

Forges large enough to handle the part, with its extreme differences in section between the hub and tapered fins, would be overloaded during wartime. The frozen mercury cast fin would introduce the component into the production line already beyond the stage of the forged blank.

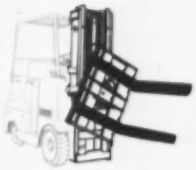
This component can be produced with comparable economy by either method, but the mercury process would free heavy tools for other work.



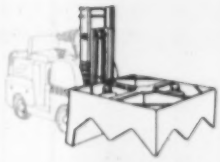
Crane Arm

Hydraulic or Mechanical Scoop

Side Shifter

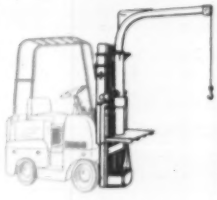


Revolving Carriage



Multiple Drum Carriage

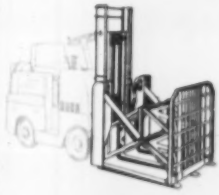
Dual Telescopic Mast



Cotton Boom

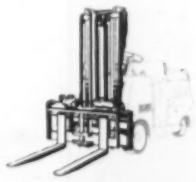
360° Rotating Carriage and Clamp

Ram

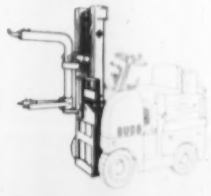


Unloader

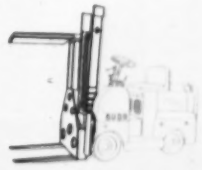
Brick and Block Forks



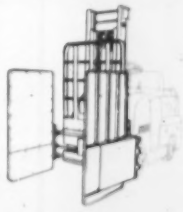
Swing Shift



Garrett Breakout



Load Stabilizer



Carton Clamp

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(II) OPERATING COST IS LESS because:

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(7) electrical energy usage for comparable operations is low
(8) top-charge, electrodes, furnace tilt and electrode clamps all operate quickly and efficiently
(9) transformer is designed to do the best job
(10) faster heats, more tons per hour

(III) MAINTENANCE COST IS LESS because:

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(12) conveniently arranged working parts
(13) roofs are interchanged in 15 to 30 minutes
(14) refractory costs are at least 15 per cent less
(15) top-charge always in alignment
(16) all parts exposed to excessive heat are amply water-cooled
(17) smooth hydraulic operation of electrodes, furnace tilt, roof lift, and swing

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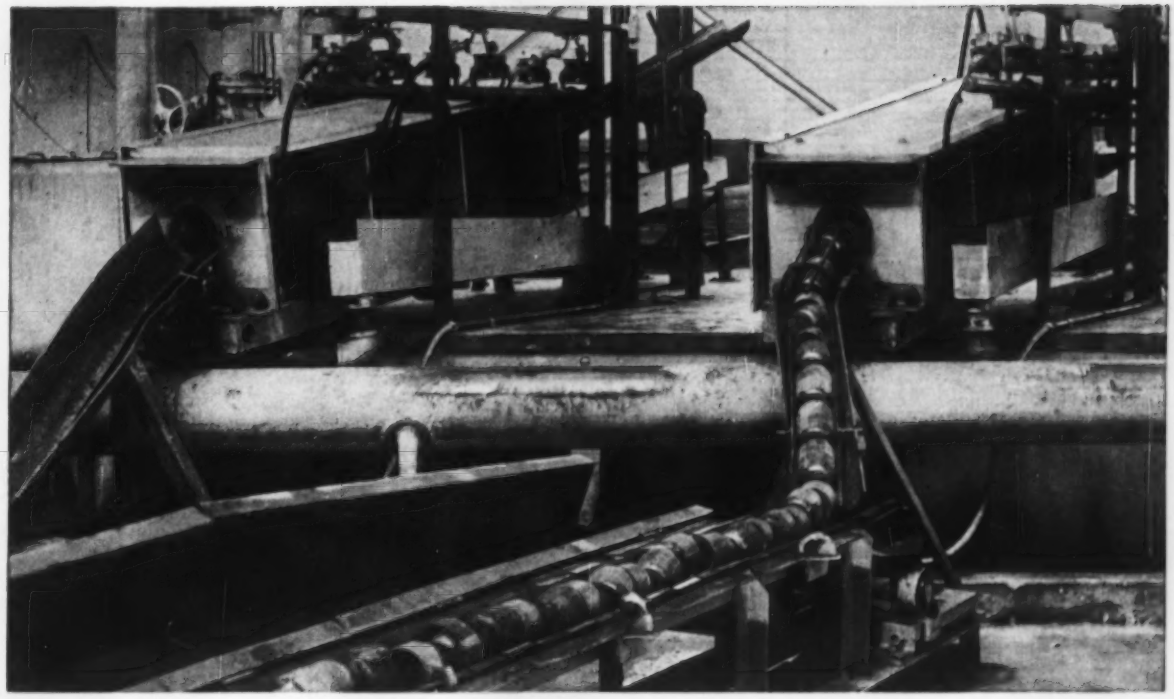
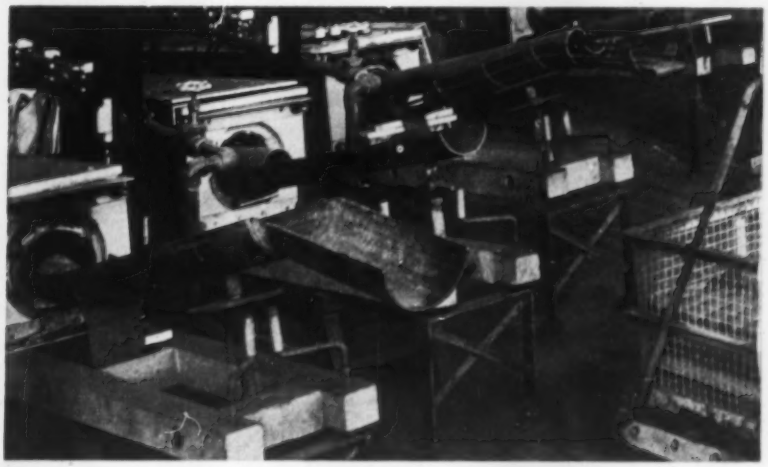


Sixty-cycle annealing at Mullins Mfg. Corp. Forgings, gravity fed through the right hand heater, are sliding onto the cooling conveyor

Mixed Annealing at 60 Cycles

TED BECK had a pipe dream.

"Why don't we run a piece of pipe through our 60-cycle inductors?" mused the Mullins Mfg. Corp. welding engineer. "Maybe we can heat parts too small for the big coils if we slide them through the pipe."



Entrance end of the heaters. Feeder tubes can be seen protruding from the coils. Cranks are for adjusting the tilt of the heaters

Let's Try—It was pointed out (and ignored) that unless the pipe were split and insulated, a short circuit would result. The parts (3 in. in diameter down to rivet size) were deemed too small for 60-cycle efficiency. Any feeding mechanism appeared to require endless versatility. The general opinion was, "it won't work."

But it did.

Balance the Cost—Of course, the doubters were right, in a sense. Sixty-cycle induction ordinarily has been considered inefficient for heating small steel parts beyond the Curie point of about 1400°F. (which is why high or dual frequency has been favored for heating steel parts less than 6 in. in diameter). But the Mullins application was to be for annealing at 1350°F—rarely higher.

Then there was the bird-in-the-hand angle. The 60-cycle induc-

tors were available, left over from other jobs. They use 440-volt line current, with simple switch gear. High frequency would have to promise tremendous gains in efficiency to amortize new inductors, motor generator sets or rectifiers and more complicated controls.

Tube Trick—But the pipe really sold the idea. By choosing a tube slightly larger than the part to be heated, and then by tilting the inductor coil, the tube became a combined gravity and induction feeding chute, doing away with the need for mechanical handling equipment. Any tendency of the tube to vibrate would help the feeding.

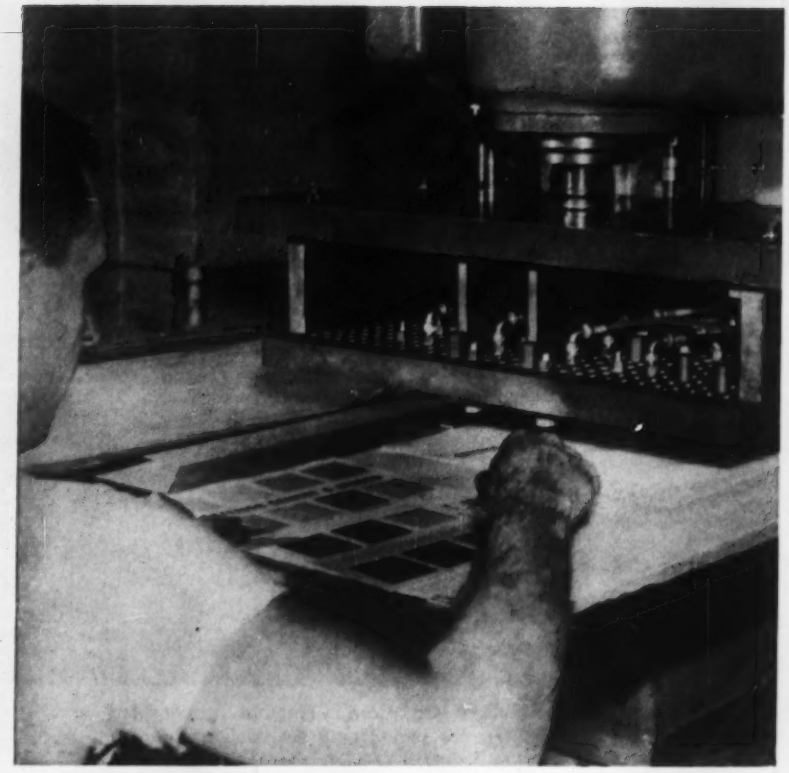
What wasn't expected was the electrical effect of the tube. It tends to focus the magnetic flux within its center, raising the induction efficiency. The gain in efficiency turned out to be a function of the diameter of the tube, its wall thickness and especially its alloy content. But even common electrical conduit worked. And the confined area of the tube almost eliminated oxidation and scaling.

At Work—Now Mullins has a bank of six of the heaters at work, using variations of the tube and tilt theme. Mostly they are annealing cold extruded shells in various stages of production. Some parts are hollow, and some solid. None is much over 3 in. in diameter. Bolt stock and rivets have been run through the heaters experimentally in lengths of common gas pipe.

Emerging from the heaters, the parts slide down a chute to a chain-type cooling conveyor. Its speed regulates that of the parts through the heater. Tilt of the coil and the degree to which it is energized also control the heating cycle.

Efficient—Heating rate goes up to 2000 lb of steel per hour per coil, with energy consumption of 1 kw-hr per 14 lb of metal heated to 1350°F. Up to 73 per cent efficiency is said to be possible with the tube-lined coils.

Loftus Engineering Corp., Pittsburgh, has been licensed to market the development, with variations for use above 1400°F. Patent applications have been filed.



When this color head die platen contacts the paper . . .

Press Prints Paint Patterns

HYDRAULIC PRESSES are versatile. At Barry Process Co. Inc., Brooklyn, N. Y., one has been adapted to print paint color charts on paper.

Result: Printing production has increased 200 per cent. Some color sheets are run off at the rate of 1000 an hour. High quality is maintained.

Color Head—Heart of the hydraulic press printing method is the color head die platen mounted on the 4-ton, Denison Multipress.

Paint nozzles are fixed into the platen according to the colors and patterns desired. Each hole in the platen can be used for a different colored paint, and paint patterns can be changed to any shape or size.

Procedure—Each sheet of paper is hand fed under the ram. As the press is cycled, the color heads contact the paper, sealing off the color die so that pressure and color are applied simultaneously. This eliminates leaking and gives good color uniformity.

Pressure control is maintained by a cylinder head relief valve. An automatic time delay keeps the die ram on the paper the necessary printing time.

Paint Feed—Paint is fed to the die platen through ½-in. plastic tubes from a pressure dome. It carries a pressure of 6 to 10 psi and can handle up to 100 different colors. Connectors on the dome are fixed, but those attached to the die platen can be moved to any location on the sheet.

The same type setup also has been used to print electronic circuits.

It pays to judge **JESSOP** by the customers it keeps

Jessop Steel Company, in case you didn't know, is an integrated producer of tool, die, high-speed and stainless steels. It isn't the largest company in the business (yet) but it is growing fast and is certainly the most diversified.

Last year, with business slightly depressed within the specialty steel industry, Jessop kept its old customers and gained new ones until it attained the largest customer list it has enjoyed at any time in its long history.

Now, this year, with the customer list still expanding and all the new and old customers buying in greater volume, Jessop is shipping more steel than ever before, and has been forced to greatly enlarge its facilities to take care of the business.

The moral of the story is this: If all these new people are bringing all this new business to Jessop they must have a reason for it. . . and the reason must be good quality and good service, because those are the things that get new customers and keep them when competition is keen. Why not climb on the band wagon and become a Jessop customer yourself? You'll be glad you did.

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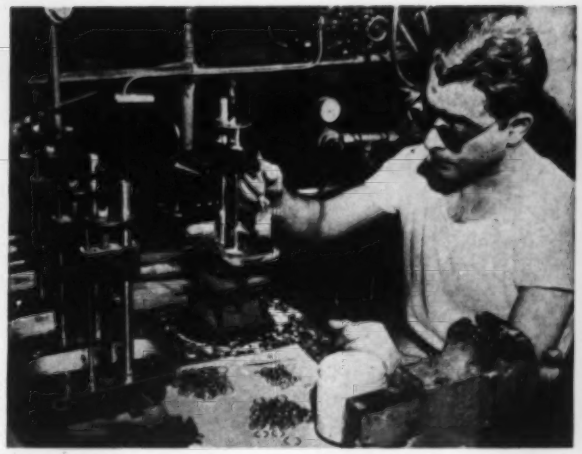


Thorough fluxing is a prerequisite for this job. It provides a protective coating which inhibits oxidation of parts exposed to the torch flame

Slow uniform heating prevents distortion of thin members. The operator uses a soft, preheating-type flame, moving the torch continuously to prevent local overheating

How to Braze Varying Gages

STAINLESS STEEL, a problem metal to braze because it's a poor conductor of heat, is even more difficult to handle when different gage parts are joined.

That's what Bastian-Blessing Co., Chicago, discovered in assembling a soda fountain syrup pump. After trying several heating methods, low-temperature, silver alloy brazing by hand torch was decided upon.

The Job—The assembly has four parts: A rectangular cover (to which a plunger housing has been crimped) 0.037-in. thick, type 302 stainless; a syrup tube of 9/16-in. OD, 0.035-in. wall, type 304 stainless; a supporting rod ¼-in. in diameter, type 303 stainless and a circular cup cover 0.093 in. thick, type 302 stainless.

For sanitary service, all joints must be completely sealed, crevice-free and filleted at both surfaces to prevent entrapment of syrup.

How It's Done—The syrup tube is brazed to the two cover pieces by pierced joints. The support rod is brazed at its lower end by a pierced joint and at its upper end by a butt joint. The crimped edge of the plunger housing, which protrudes through the cover, must be covered with a uniform fillet.

Bastian-Blessing brazes these joints with preplaced rings of Handy & Harman Easy-Flo 45 silver brazing alloy. The firm makes its own rings by coiling the alloy wire on mandrels. Three different wire gages are used for joints: 0.025, 0.031 and 0.062 in.

Brazing Fixture—Design of the fixture prevents distortion of the steels while brazing. It supports, but does not grip, the tube and rod. Clamping would restrict free expansion of the parts and cause distortion on the thin-gage cover.

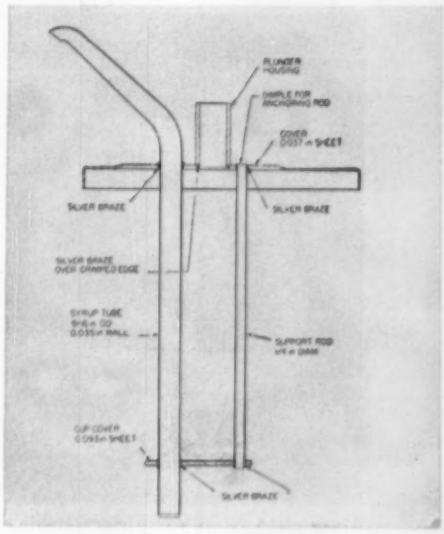
All parts are thoroughly degreased in trichloroethylene before assembly and fluxing.

Fluxing—The assembly is fluxed and brazed on a 7-in. turntable which rotates about 15 rpm. Although joints are confined to a fairly small area, all surfaces of the cover and most of the tube, rod and cup cover are liberally fluxed. The flux not only wets the joint surfaces but also provides a protective coating to inhibit the formation of oxides on the surrounding metal during heating.

An oxyacetylene hand torch with a multiple-jet tip is used for heating the work. This provides a soft, preheating-type flame and avoids overheating the metal and exhausting the protective flux too rapidly. A 2:1 ratio of acetylene to oxygen produces a slightly reducing flame and inhibits the formation of oxides.

Brazing—First joints made are the three on the rectangular cover. With the work rotating, the operator first heats the rod and tube which must receive more heat than the thin cover. The assembly is heated until the flux has a glassy liquid appearance. Then the first joint is heated to red heat to melt the alloy ring in place. The remaining two joints on the cover are brazed in the same manner as are the two joints on the circular cup cover.

Bastian-Blessing requires fillets on all joints for sanitation reasons. (Fillets do not materially increase the strength of a joint.) To get the full fillets on both sides of a pierced joint, the operator heats the upper and lower surfaces of



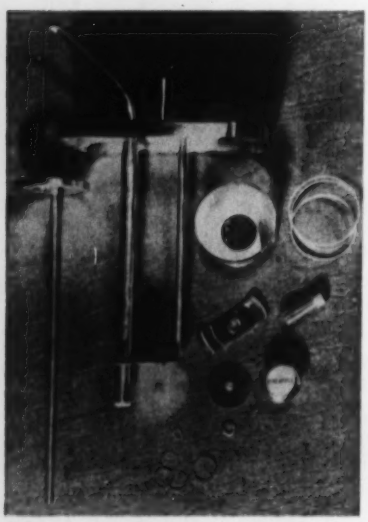
the cover equally. When the alloy ring melts, part of it is sucked into the aperture to form not only a solid joint but fillets on both edges. Excess alloy (the amount not needed to fill the joint) determines the size of the fillets.

Other Parts—In addition to the five joints on the tube-rod-and-cover assembly, several other components of the pump are silver brazed. The piston is assembled by threading a rod into a flanged disc and then brazing an alloy ring over the threaded joint. The braze seals the joints, prevents seepage of syrup into the threads and makes a stronger assembly.

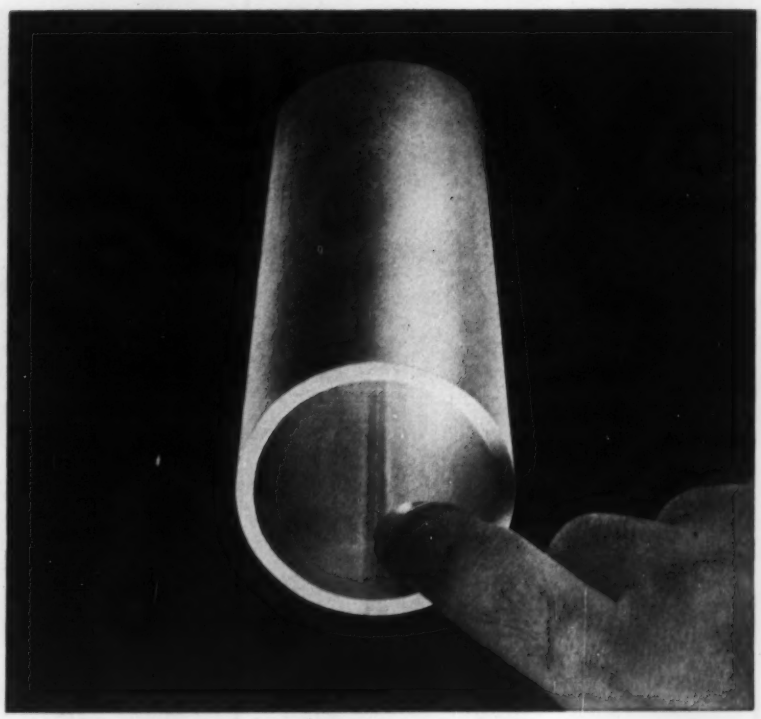
The valve disc, next to the flavor cap, is assembled by silver alloy brazing. A stud at the center of the disc is fastened by crimping, and brazing alloy is used to seal the joint.

Finishing—After brazing is completed, assemblies are air-cooled for a few seconds, then quenched and allowed to soak in cold running water. Rapid cooling causes spent flux to flake off, and the balance is soaked off. The assemblies are then dipped for 2 to 3 minutes in a molten salt bath which converts any oxides on the steel to a more soluble form. Final steps are a pickling bath, electropolishing and buffing.

From one to three brazing stations are operated at Bastian-Blessing. Average operating cycle, including fixturing, fluxing, brazing and quenching, is about 9 minutes per assembly.



A complete syrup pump disassembled



A slick, beadless weld inside because . . .

Gravity Smooths Tubing's Troubles

TRADITIONALLY, welded tubing has been plagued by a bead on the inside diameter. This made it difficult to produce high-quality pipe by cold working after welding.

The weld has been made from above as the tube emerges from the forming rolls—the obvious way to do it.

Gravity at Work — The weld bead bulges down in response to gravity, reasoned Trent Tube Co. engineers. Why not put it to work smoothing the bead? They turned the welder and forming rolls upside down and tried welding from the bottom.

It worked, although not quite so simply as it sounds. But when the bugs were out, they had welded tubing with a perfectly smooth interior, and a weld bead on the outside that can be closely controlled in contour.

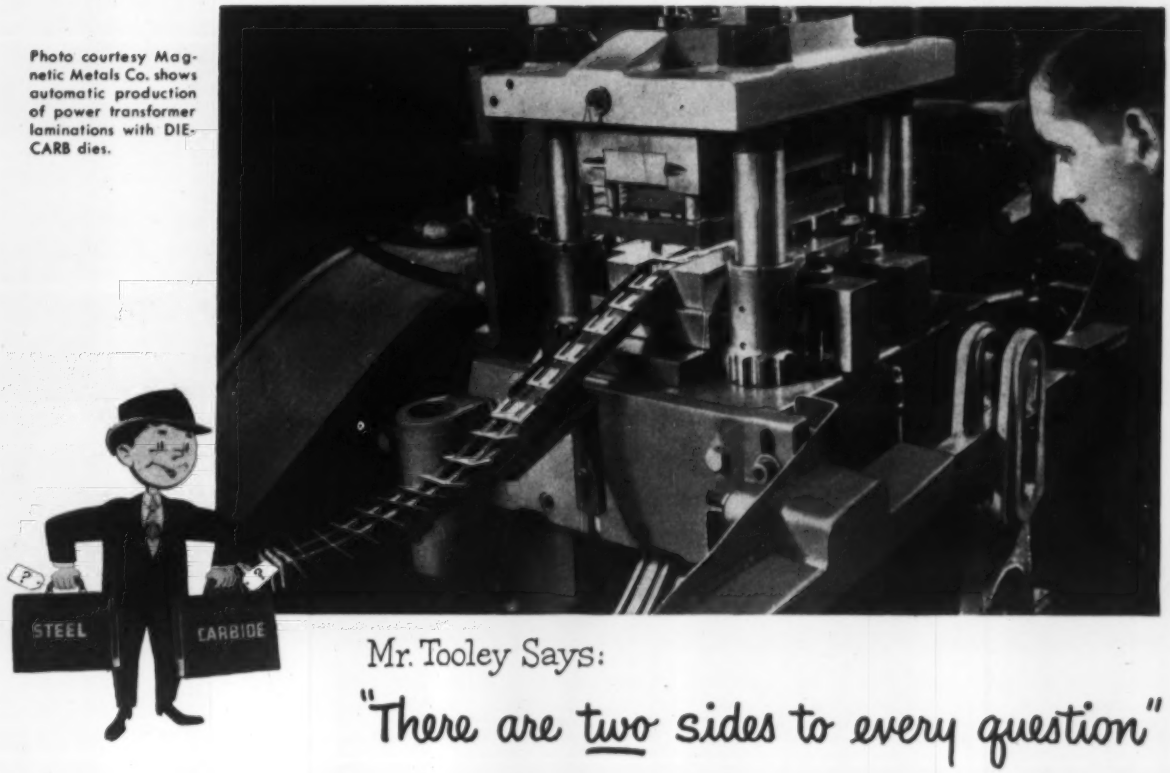
Benefits—The East Troy, Wis., subsidiary of Crucible Steel Co. of America is producing its Trent-weld tubing by the patented weld-from-below technique. Advantages: Improvements in physical properties, drawing quality, appearance and corrosion resistance.

The exterior bead can be reduced by swaging to further improve physical properties. Heavy wall tubing meets flare, transverse, tensile and reverse bend tests, says Trent.

New Products — The company finds it possible to produce extremely thin walled tubing of stainless steel, various Hastelloy grades, zirconium, Zircoloy, titanium and other problem metals. Tubing for aircraft hydraulic lines and heat exchangers is being drawn. Tube sheets are rolled from high and superalloys that formerly had to be weld fabricated.

The inert-gas, shielded-arc welding process, used in the former method of tube manufacture, has been adapted to the new technique.

Photo courtesy Magnetic Metals Co. shows automatic production of power transformer laminations with DIE-CARB dies.



Mr. Tooley Says:

"There are two sides to every question"

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HIGH CHROME STEEL

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- **Better edge wear**
- **Safe to heat treat**
- **Easier to machine**

DIECARB

THE HIGH PRODUCTION CARBIDE

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- **High resistance to shock and abrasion.**
- **Low regrinding cost.**
- **Greater production per die life.**

The question of which die material to use for blanking and laminating operations involves a choice of either *steel* or *carbide.* Consideration must be given to the factors which determine die life, such as abrasiveness of the material to be worked, burr limit, distortion of product or elimination of subsequent machining operations.

In the selection and purchasing of die materials, Firth Sterling offers you *unique* advantages because it manufactures *both* steel and carbide. From *one* dependable source of supply you are assured of completely *un*biased recommendations and the *right* steel or carbide or *both* for every die making need.

Typically, Firth Sterling DIECARB and Firth Sterling CROMOVAN (die steel) are widely used for blanking and laminating operations, depending upon job requirements. Write today for literature and unbiased recommendations for your specific needs.

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Corrosion test panels and tensile test specimens exposed on a roof in New York. They weathered there for 20 years

A 'Lifetime' of Corrosion

THE GRAPH shows how a cross section of nonferrous alloys fared after 20 years of weathering at seven test sites.

In general, corrosion rates proved fastest in industrial atmospheres, slowest in rural, ASTM corrosion experts report. The most reliable findings were weight losses. Tension specimens, cut before exposure, corroded on all sides and differed widely on tension testing from specimens machined later from exposed flats.

Seven Sites—Some alloys exposed are either no longer produced or are made in altered form. Some compositions differ little from modern products.

Exposure sites covered three general atmospheres: Marine, industrial and rural. They were: Altoona, Pa. — industrial; New York—industrial marine; Sandy Hook, N. J.—northern marine; Key West, Fla.—tropical marine; La Jolla, Calif.—severe marine; State College, Pa.—northern rural; Phoenix, Ariz.—rural dry. Control specimens were stored indoors by the Bureau of Standards.

Cities Rough—As expected, the industrial atmospheres of New York and Altoona proved to be the severest. Among the copper alloys, those with high copper content did best. Cartridge brass dezincified, but with the exception of it and a high-tensile brass no longer made, all coppers showed corrosion rates low enough to prove them suitable for industrial atmospheres.

Nickel, high nickel alloys and zinc did poorly in the city air.

Salt Air—With the exception of phosphor bronze, duralumin and tin, metals survived well in the extreme marine atmosphere of La Jolla. Many specimens at Key West and Sandy Hook were blown away, to make those results spotty. Generally, findings were essentially like those at La Jolla. All metals, except tin, showed less corrosion than city specimens.

Rural and desert results were essentially negative. Specimens showed only light corrosion, with cartridge brass, cupro-nickel and prime western zinc corroding most.

Tension Tests—The tension picture is confused. To some extent, all tension specimens were corroded and subject to notch weakness.

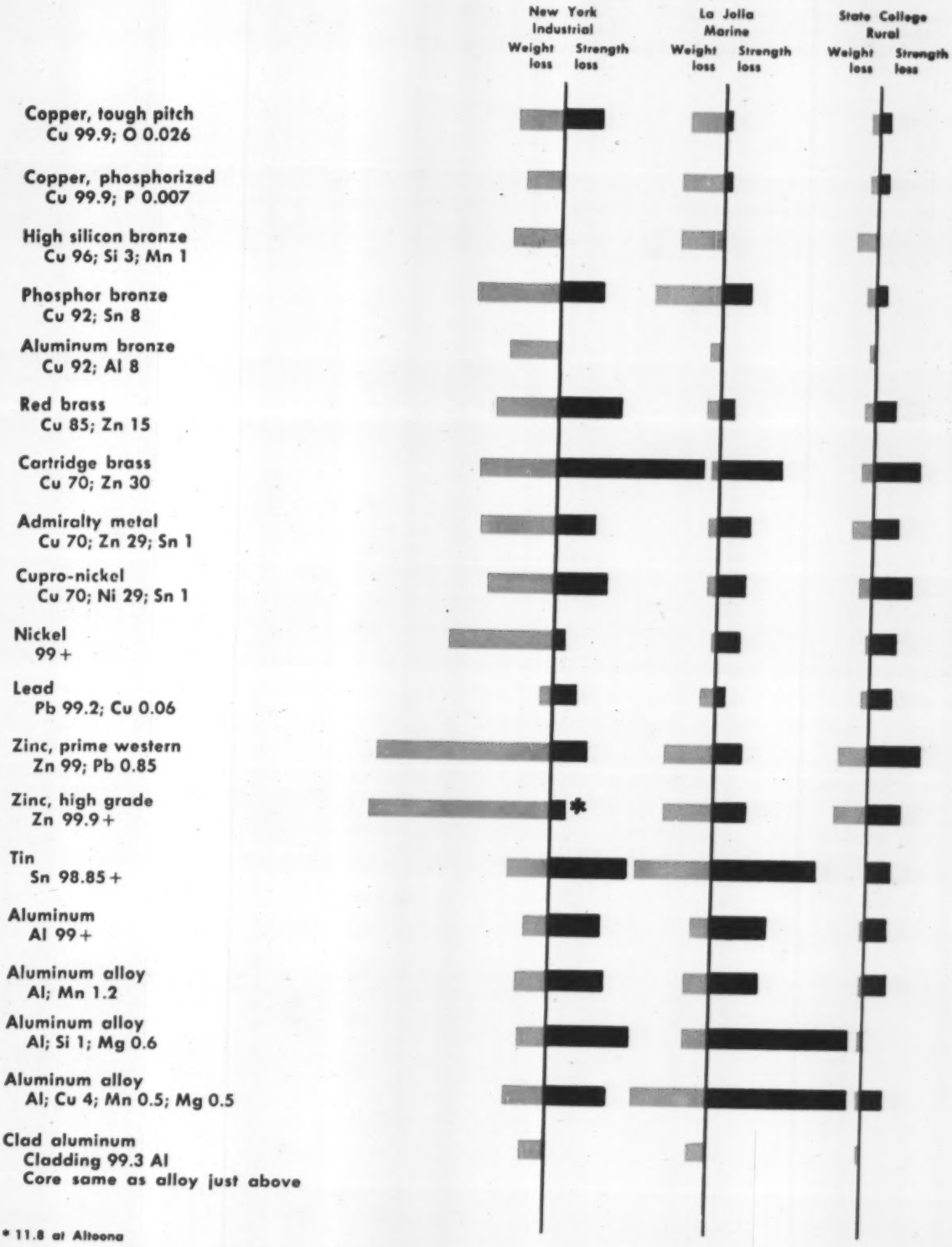
On the tension specimens machined from exposed plates, heavy corrosion did not always show up in radically lowered tensile strength. Cupro-nickel (70 per cent Cu) showed about the same average loss in tensile strength (4.0 to 6.6 per cent) in all areas, although its corrosion rate varied considerably. A 75 per cent cupro-nickel showed some slight gains in tensile strength, and there were other scattered examples of such gains.

On the whole, tensile strength losses mirrored corrosion losses, with cartridge brass, red brass, aluminum alloys, commercial lead and tin being the most severely effected.

Full results were presented in a series of papers at the annual meeting of the American Society for Testing Materials. The graph gives an average picture.

Per Cent Losses in Weight and Tensile Strength Over 20 Years

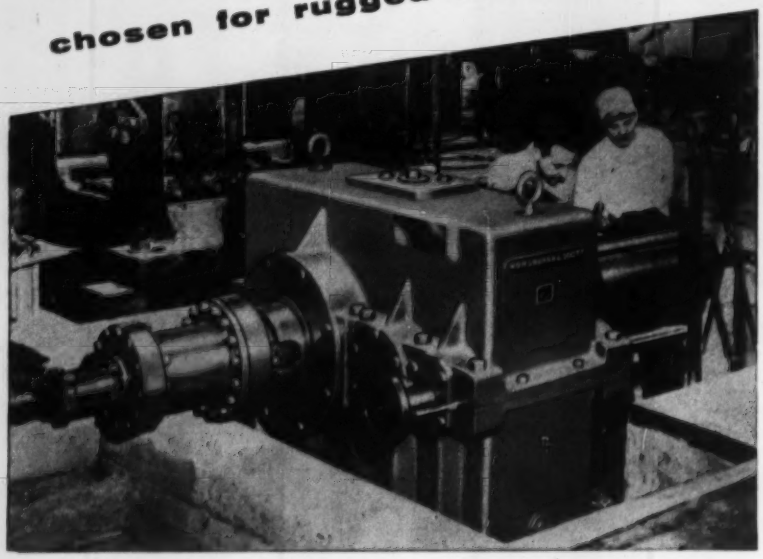
(½-in. equals 10 per cent change)



* 11.8 at Altoona

H&S Speed Reducer

chosen for rugged dependability!



Based on past performance records, one of the nation's leading steel producers specified an H & S RD-4000-H Herringbone Speed Reducer to drive the tension reel on their new 26 inch skin pass mill for cold finishing stainless steel.

This is just another example of the reliable engineering construction and quality built into every H & S speed reducer whether it is a Worm Gear, Helical or Herringbone type. Self-lubricated, they are simply but ruggedly constructed for long-lived efficiency. They permit the use of standard, high-speed motors that are more efficient and economical.

Let us help you with your power transmission problems. With an H & S speed reducer you can be sure of ample capacity, correct speed and trouble-free, low cost maintenance. With our complete line to select from, you are assured of unbiased recommendations. Contact your H & S representative or write us today!

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GEARS AND SPEED REDUCERS

5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on Company Letterhead for 488-Page Catalog 49

Built-in benefits added when . . .

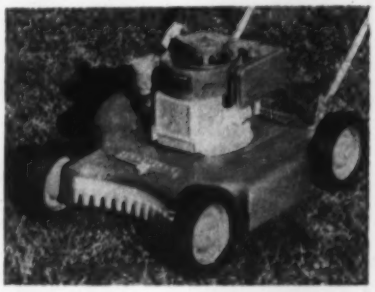
Mower Housing Die Cast

TO DESIGN a new 19-in. Craftsman rotary lawn mower, engineers of the Newark Stove Division of Sears, Roebuck focused their attention on the housing. The requirements: Light weight, high strength, dimensional accuracy, neat appearance and adaptability to mass production. Diecasting was their choice.

Cast in one piece, the aluminum (ASTM Spec. B85-52T) housing measures 24 x 20½-in., and is characterized by thin walls which are thickened at points of stress concentration. Holes for mounting wheels and other accessories are formed during casting by means of cores in the die.

Cast-in Extras—In the center of the housing, a circular opening about 7 in. in diameter is cast to size for mounting the motor. Die casting made it economically practical to design such features as an inset wheel for edge trimming and a large grass discharge outlet into the one-piece housing.

Brand identification and safety operating instructions are cast in.



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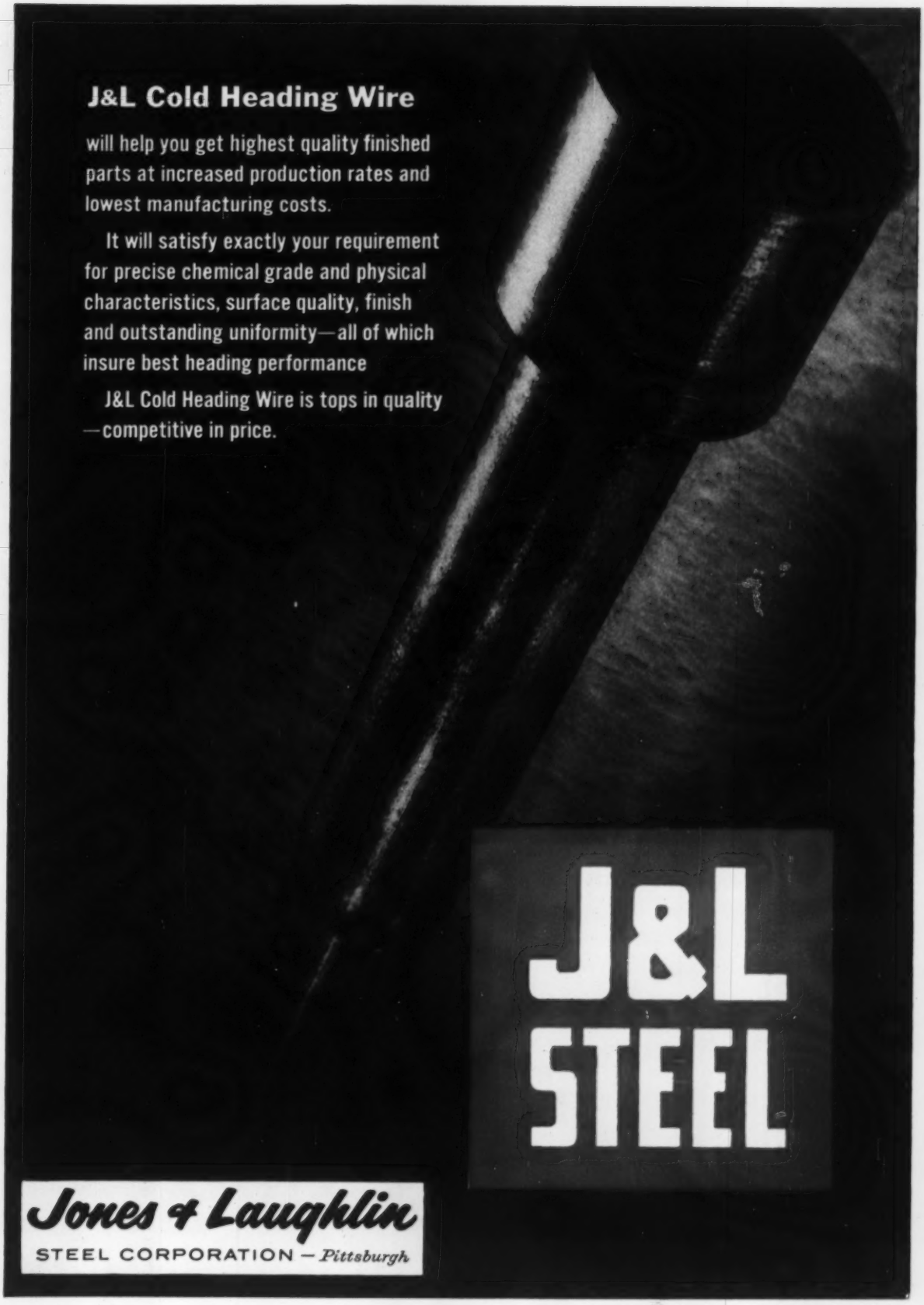
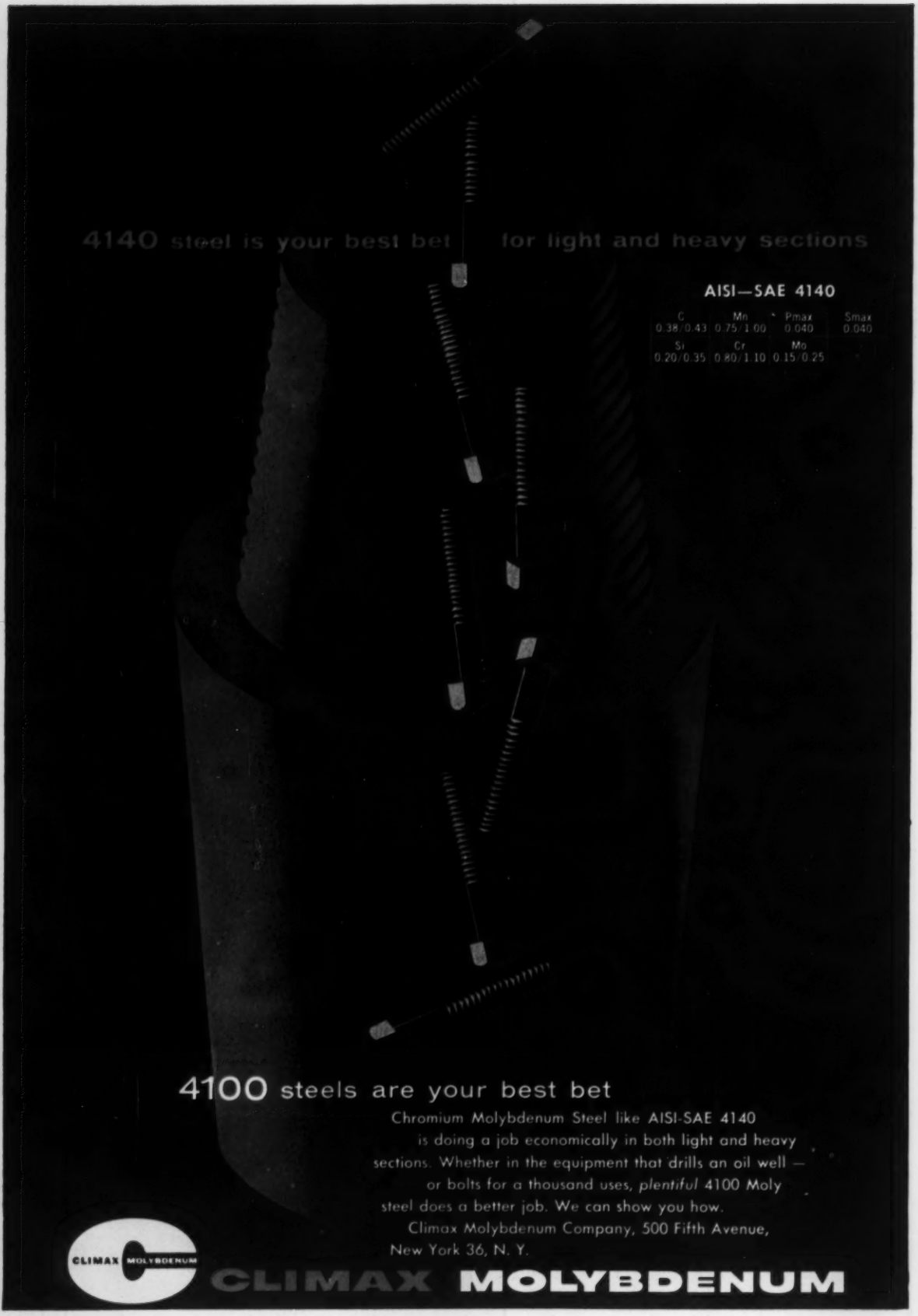


J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*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Mn 0.75/1.00
Pmax 0.040
Smax 0.040
Si 0.20/0.35
Cr 0.80/1.10
Mo 0.15/0.25
4100 steels are your best bet
Chromium Molybdenum Steel like AISI-SAE 4140 is doing a job economically in both light and heavy sections. Whether in the equipment that drills an oil well — or bolts for a thousand uses, plentiful 4100 Moly steel does a better job. We can show you how.
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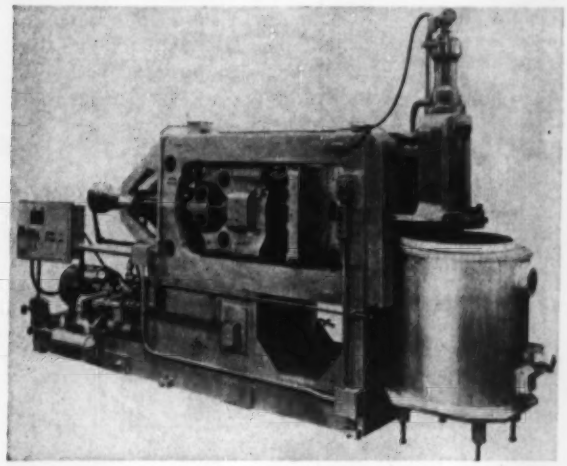
600-Ton Zinc Diecasting Machine



Here is a zinc diecaster that has an average rate of 280 shots an hour on a large area, multicavity die. It will cast up to 15¼-lb of zinc or proportionate weights of lead or tin.

Only one adjustment is needed to set up the zinc end; the shot system is in machined slots in a one-piece yoke. The furnace and melting pot are large and easily fed or emptied.

Both shot speed and pressure are adjustable. A nitrogen accumulator gives high-speed injection. The heat treated steel plunger tip has piston rings. There are two fixed shot positions.

Die setup is easy; one hand crank adjusts die height. Die opening is 14 in. The movable platen is 40 in. wide. Die space is accessible from all sides. *Write*: Dept. N-2, Lester-Phoenix Inc., 2711 Church Ave., Cleveland 13, O. *Phone*: Cherry 1-1046

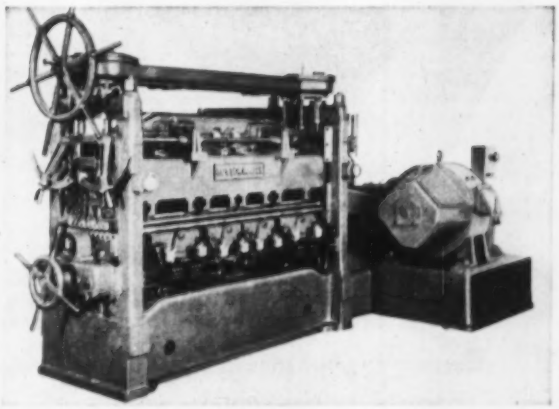
Double-Tilt Levelers Flatten Sheet Stock

Any metal in any gage can be flattened by this unit. It comes with 13, 17 or 23 rolls.

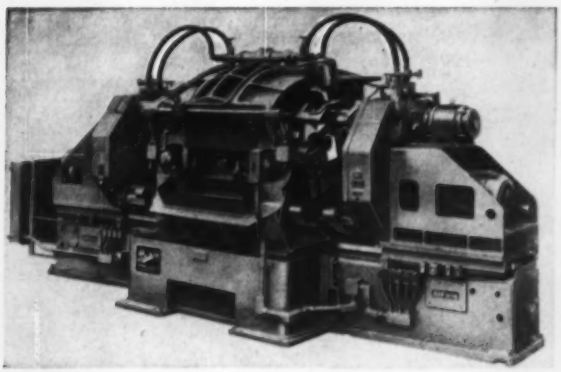
A patented double-tilt roll principle is used: The position of the rolls permits a greater area of contact with work than conventional levelers do.

In the 17-roll machine, an upper bank of eight opposes a lower bank of nine rolls. The center four of the upper bank are parallel to the lower bank. Two entry and two exit rolls of the upper bank are tilted upward symmetrically.

This positioning facilitates feeding of stock and makes for precision flattening. The operation is reversible without roll adjustment. *Write*: Sutton Engineering Co., First National Bank Bldg., Pittsburgh 22, Pa. *Phone*: Grant 1-8077



Machine Does 34 Operations on 70 Pieces an Hour



Plymouth uses this machine to produce its crankshafts. Doing 30 operations from left-hand side and four from the right it features power indexing, power clamping of fixtures by a power wrench with torque control and multiple heads of master gearbox construction. Bushing plates register into the fixtures at each station.

All parts are completely interchangeable. Each component assembly is located by precision-bored dowels. Hardened-and-ground laminated tool steel ways are automatically lubricated. *Write*: Buhr Machine Tool Co., Ann Arbor, Mich. *Phone*: Normandy 2-5646

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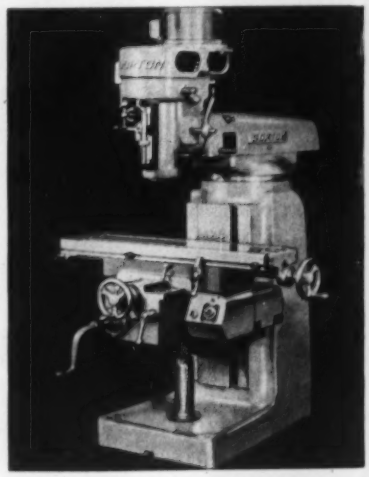
NEW PRODUCTS and equipment

Swivel-Head Mill

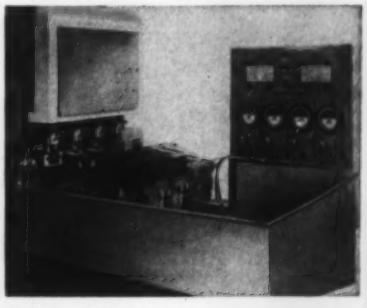
The turret-type ram of this vertical machine can be indexed 180 degrees to take high-speed drilling, milling, grinding and slotting attachments. A double range of spindle speeds is available, so that jig boring can be done with dial indicators and end measuring rods. The machine is designated the "Master Mil."



The machine has a self-retracting spindle, with both hand lever and micrometer down feed. Column and base are ribbed internally. Ram is of box construction. Knee and column ways are of square lock bearing design, with narrow center guide on the knee. *Write*: George Gorton Machine Co., Racine, Wis. *Phone*: 4-6644

Machine Control Gage

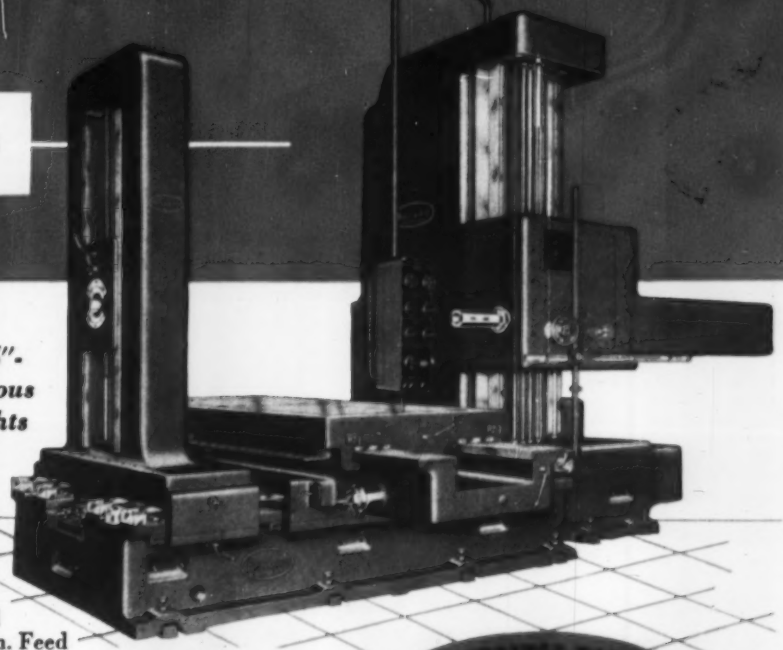
The Air-O-Limit automatic gage provides for inprocess gaging and automatic feedback corrections. It allows for step impulse changes to the machine controls for tool resetting to maintain tolerances. Re-



outstanding DESIGN and PERFORMANCE are incorporated in the new . . .

BULLARD HORIZONTAL BORING, MILLING and DRILLING MACHINES

MODEL 75



Available in 3"- 4"- 5"- spindle sizes with various bed lengths, post heights and table sizes.

PENDANT CONTROL – complete machine control from a movable pendant station. Feed and speed rate selection, directional feed and traverse engagement of the spindle, head, table and saddle, spindle rotation and operation of head binders are accomplished from the Pendant.

BOTH SCREW AND RACK FEED – to the spindle provide smooth, steady screw feed for boring and sensitive hand feed for small drilling and tapping.

SPEED RANGES – 9.5 to 2000 R.P.M. on 3" and 5.83 to 1200 R.P.M. on 4" and 5" sizes, meets any machining requirement.

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AUTOMATIC POSITIONING – for head and table (optional)

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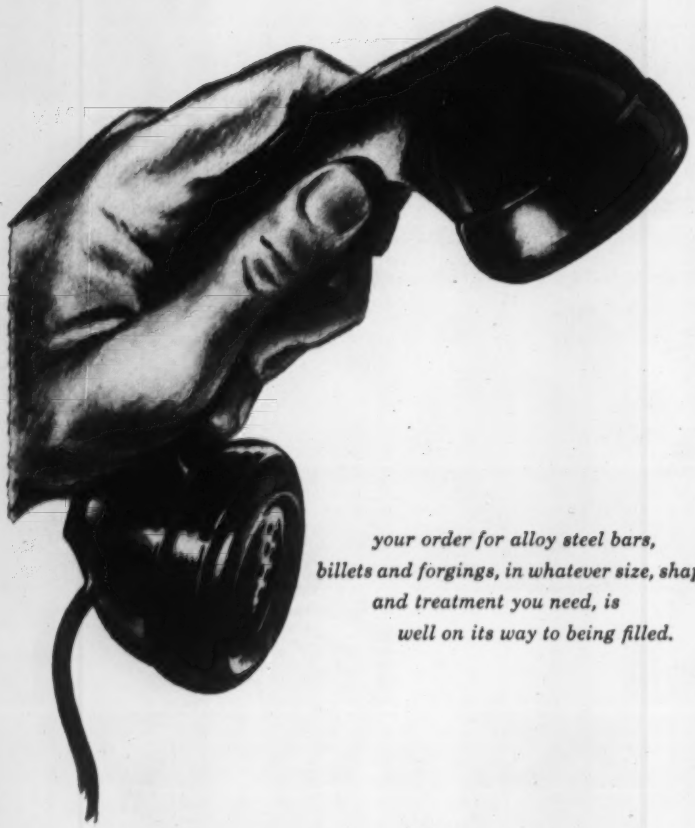

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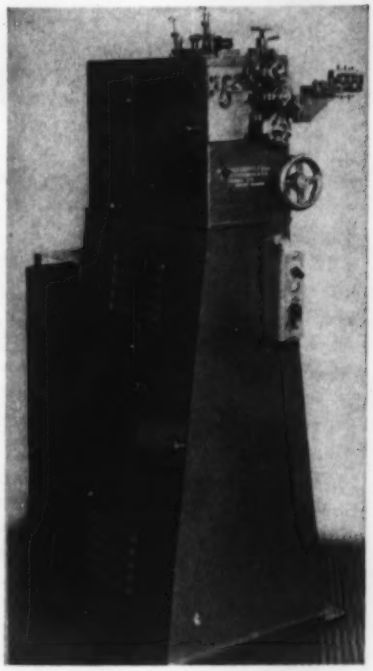
NEW PRODUCTS and equipment

jects will cause machine to stop.

Main control cabinet contains light signals for out-of-tolerance warning and four standard package gage units with calibrated air indicators for direct diameter readings. Readily adjustable control limits can be preset to any portion of the scale to meet tolerance requirements. *Write*: Pratt & Whitney, Division Niles-Bement-Pond Co., West Hardford 1, Conn. *Phone*: Adams 3-7561

Universal Spring Coiler

The No. 0, escapement-type machine coils long lengths at high speeds. Feed roll grooves are uniform throughout the periphery and rolls are directly separated by cam action.

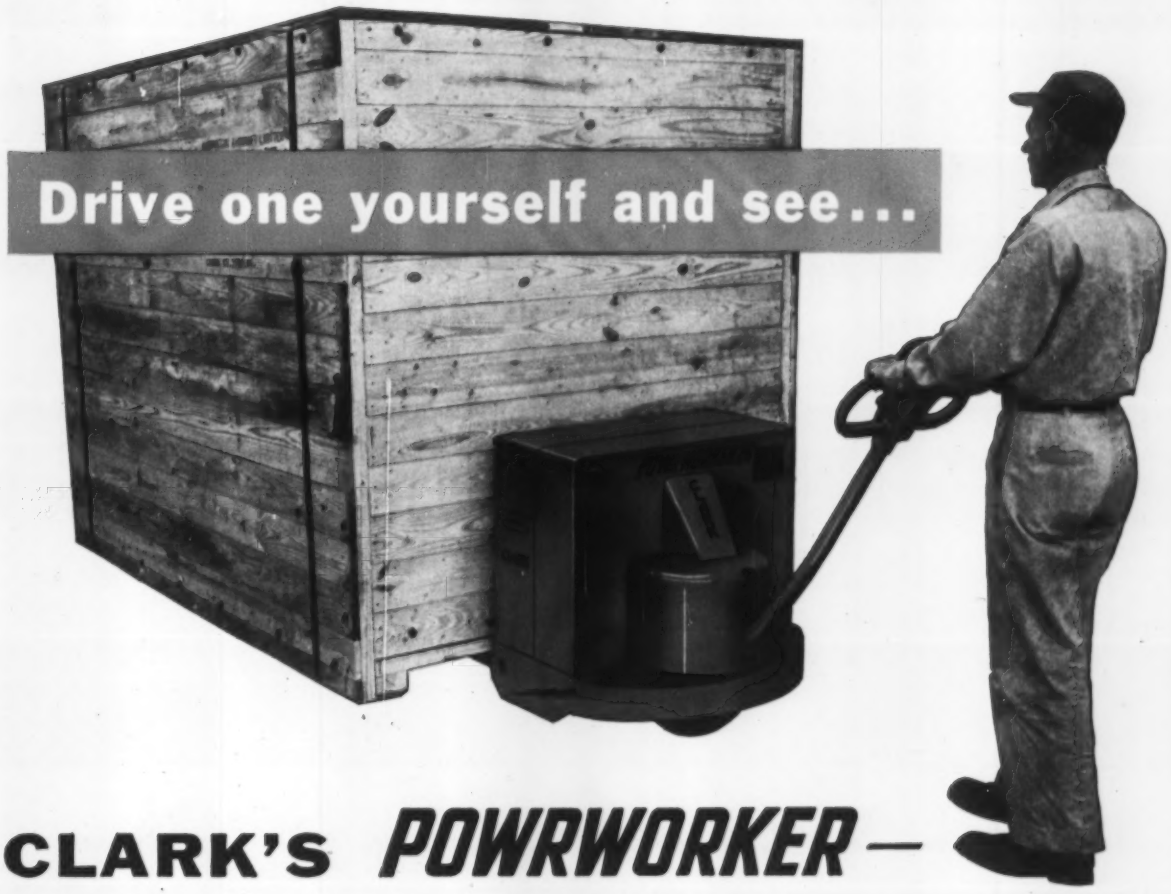


Range of this machine, using a 1:1 gear ratio, is 55 to 550 springs a minute. *Write*: Sleeper & Hartley Inc., Worcester, Mass. *Phone*: Pleasant 4-3249

Heavy-Duty Gear Hobber

A high-production machine, the Model 7, type HD, is equipped with self-loading and unloading, automatic gaging and tool adjustment.

The unit features a welded steel base, with chip cleanout chute;



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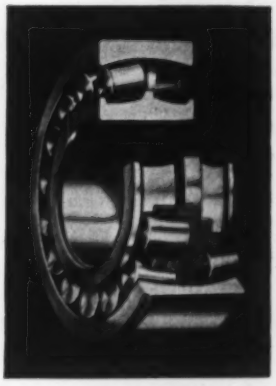

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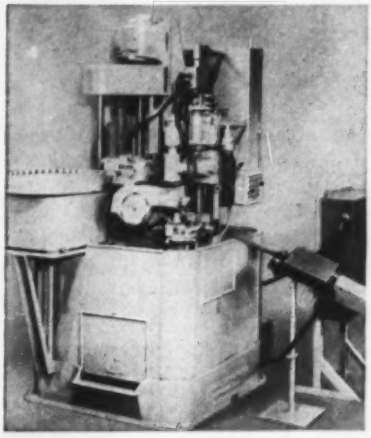
heavy headstock and column; hob head with full bearing spindle for speeds up to 1000 rpm and a 3-in. controlled hob shift; double-nut lead screw. Main drive and rapid

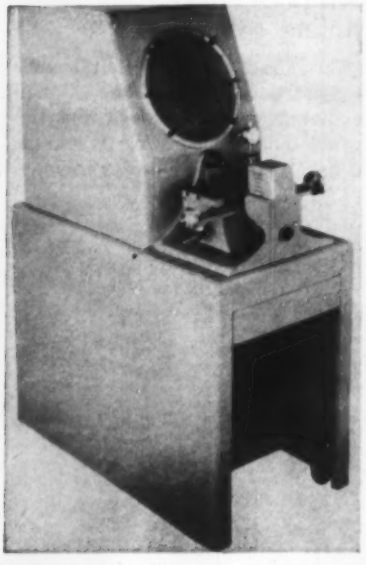


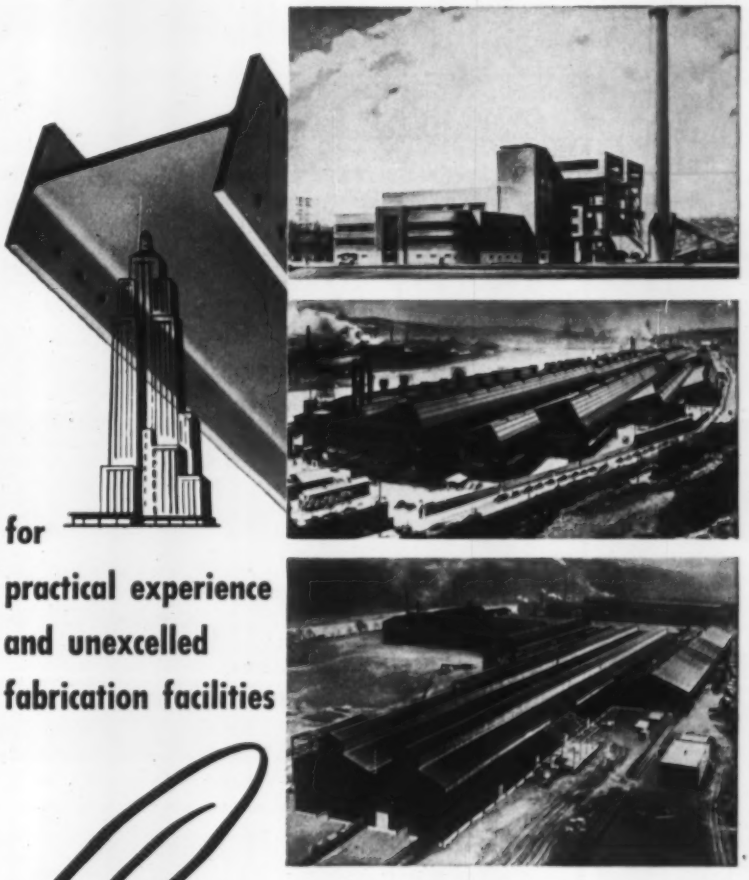
traverse motors are mounted at the top of the machine out of reach of coolant and chips. *Write*: Lees-Bradner Co., Cleveland 11, O. *Phone*: Orchard 1-2200

Optical Comparator

All measurements on the No. 14 are taken by direct readings from Swiss-type carbide-tipped dial indicators. The screen (14 in. in diameter) gives a halo-free image. A 25X lens is standard equipment. Also available are 10X, 31.25X, 50X, 62.5X and 100X lenses.

The top stage moves horizon-





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NILSON 4-SLIDES FEATURE—

- ONE-MAN OPERATION
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- ONE FAST, AUTOMATIC OPERATION WHICH STRAIGHTENS, FEEDS, PIERCES, BLANKS, SWAGES, STAMPS OR COINS, CUTS OFF, FORMS
- CRITICAL TOLERANCES UP TO .002 ON ANY RUNS
- FAST TOOL AND DIE CHANGING
- WIDE SIZE RANGE—FORMS WIRE UP TO ½ IN. DIA. IN FEEDS TO 32 IN. MAX. AND RIBBON STOCK UP TO 3½ IN. WIDE
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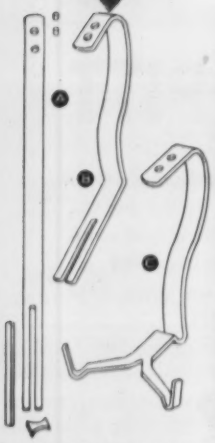
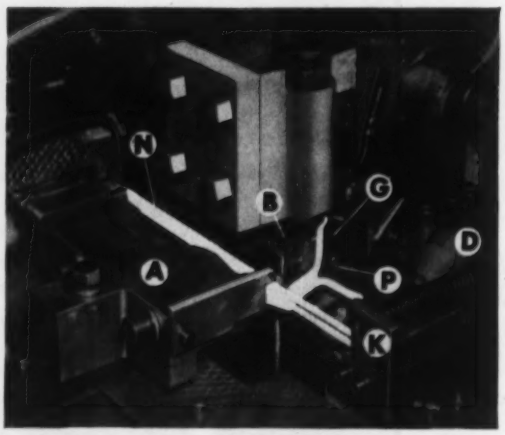
Without obligation, Nilson provides specific forming recommendations from detailed information. Send for A. H. Nilson catalogue . . . the first step to increased production.



Stand is zinc-plated steel strip 0.05 in. thick by 0.625 in. wide . . . made in steps A, B and C.



Final step in forming Kaz stands on Nilson 4-slide. Feet are spread, bent, crimped (G) with workpiece (P) on centerpost while next piece (N) is being cut off. Stop (K) on right slide (D) backs off after cut and workpiece (P) is wrapped around centerpost by die (A) when finished part is clear.

A.H. NILSON MACHINE COMPANY

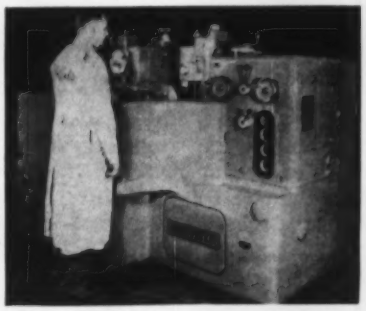
1512 RAILROAD AVE. BRIDGEPORT 5, CONN.

NEW PRODUCTS and equipment

tally on hardened steel balls in a ground V and flat way. Working area is 6 x 13 in. Horizontal movement is 6-in., vertical movement 2¼-in. The cabinet is on casters. *Write*: Covel Mfg. Co., Benton Harbor, Mich. *Phone*: Walnut 6-6157

Gear Grinder

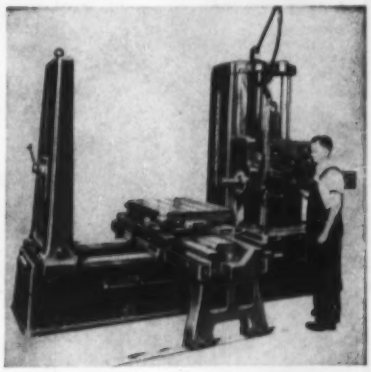
Maximum work diameter of the Model 140 is 8 in. Grinding stroke is 4 in. The unit is designed for production of precision ground helical and spur gears from 8 to 50 pitch. A number of gears of the same type can be ground in the same setup.

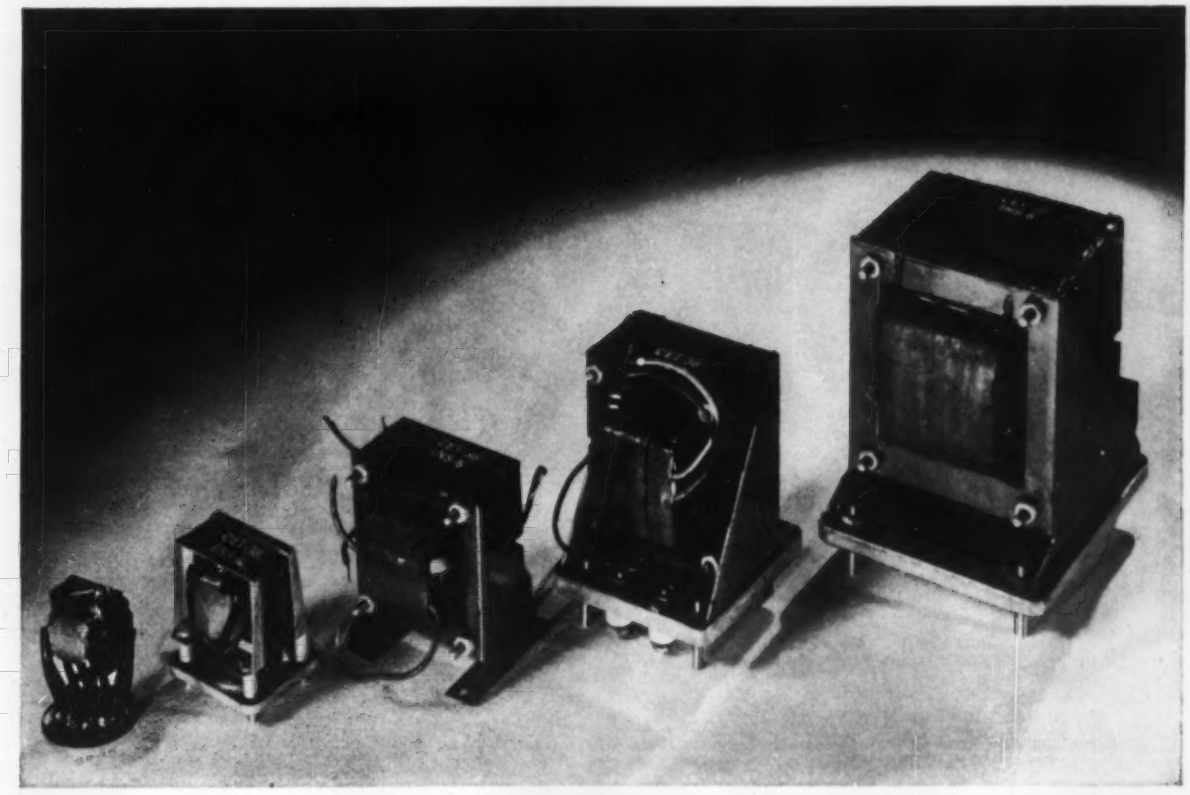


The grinding wheel is formed by the Crushtrue dressing process to the basic rack form and then finish dressed with a cam-operated diamond dresser. *Write*: Sheffield Corp., Dayton, O. *Phone*: Kenmore 3131

Boring, Drilling Milling Machine

The No. 300-RT horizontal model features a 30 x 36 in., built-in revolving table for fast and accurate indexing of difficult setups. It has a 3-in.-diameter spindle, a





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84 pages of valuable technical data on standard and custom-made laminations from all grades of Allegheny Ludlum magnetic core materials. Prepared from carefully checked and certified laboratory and service tests —includes standard dimensions, specifications, weights, etc. Sent free on request . . . ask for your copy.

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★ **ALLEGHENY SILICON STEEL**

★ **ALLEGHENY 4750**

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The operation of a transformer is no better than the magnetic core around which it is built. With Allegheny magnetic materials in the core, you get the *best*—uniformly and consistently.

Sure there are reasons why! For one thing, there's the long experience of a pioneer in development and quality control of electrical alloys. But most important, the A-L line offers complete coverage of any requirement you may have, any service specification. It includes all grades of silicon steel sheets or coil strip, as well as Allegheny Silectron (grain-oriented silicon steel), and a wide selection of special high-permeability alloys such as Allegheny 4750, Mumetal, etc.

In addition, our service on magnetic materials includes complete lamination fabrication and heat treatment facilities. What's more, this extensive experience in our own lamination stamping department is a bonus value for all users of A-L electrical sheets or strip. ● Let us supply *your* needs. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

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ALLEN KEYS

New bright finish
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*Lower prices***

Now the hex keys furnished in Allen key sets have a high luster coating — better looking — rust resistant — makes size markings easier to read.

Available in six sets, all packaged in new red-trimmed plastic envelopes.

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***No. 605**	6 short arm keys	.050″ through 5/32″
No. 606	11 short arm keys	.050″ through 3/8″
No. 614	11 long arm keys	3/32″ through 5/8″
***No. 616**	9 extra long arm keys	5/64″ through 3/8″

**Bright Coated Keys* ***On Nos. 604 and 605*

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STERLINGS are my FIRST Choice because they LAST!

For STAMINA, long-lasting ruggedness, you can't beat Sterling Wheelbarrows. Users say they seem to last "forever". Work them hard, overtime, in toughest service . . . you'll agree Sterlings survive hard punishment . . . again proving . . .

IT PAYS TO BUY THE BEST.

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

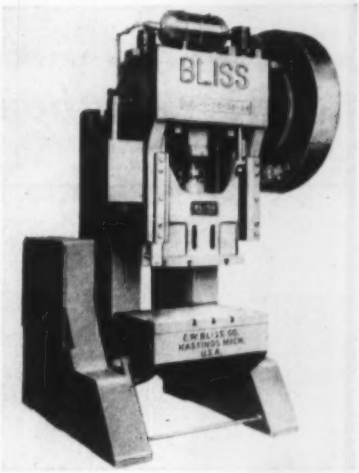
Sterling WHEELBARROWS

72-in. bed and 48 in. of headstock travel.

Other features: Independent operation of headstock, table and saddle in either direction; hardened bed, saddle and column ways; spindle speed range of 7 to 1600 rpm and an electric pushbutton pendant providing convenient control at any point within the operator's working range. *Write*: Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. *Phone*: 9400

Air Clutch OBI Press

Heavier than most OBI presses, this 75-ton model of a new series features a totally enclosed frame and box-type crown. It has a motorized inclining mechanism, a new automatic rotary limit switch, return oil systems and the Bliss Type-M clutch, a combination clutch and brake mounted on the crankshaft.



Sizes in the series run from 75 to 200 tons. Die spaces and electrical controls conform to JIC standards. *Write*: E. W. Bliss Co., Canton, O. *Phone*: Canton 7-3421

Universal Drilling Machine

The spindle unit of the Model HU110 (a vertical, single-column, hydraulic feed, joint-type machine) has 24 drivers, each with individual, two-speed-and-neutral adjustment. Main drive is provid-

ed with the same adjustment superimposed on the individual spindle driver speed selection.

Full power of the driving motor can be taken through either the right or left group of 12 spindles without overloading. Hydraulic travel is 18 in. Drilling area is 15 x 24 in. Machine capacity is twenty ½-in. diameter drills in cast iron. *Write*: Moline Tool Co., Moline Ill. *Phone*: 4-2418

Two-Way Bender

The Series 1400-A, semiautomatic machine does both clockwise and counterclockwise bending. Complete change-overs in tooling can be made in 2 minutes.

The unit handles small lot bending jobs where multiple planes and odd shapes formerly made it necessary to use several setups and machines. Shown is the unitized head and top assembly set for clockwise operation. *Write*: Pines Engineering Co., Aurora, Ill. *Phone*: Aurora 6-7701

Vertical Mill

The 8-ft, Hypro, heavy-duty boring and turning mill has box-type housings and an extra-heavy bed and table unit that supports table loads up to 55 tons. Two precision antifriction table tracks support the work. A large tapered roller bearing at the center of the table prevents misalignment of table or work due to radial thrust.

The unit features a right-and-left-hand, ram-type swiveling rail

You can get the steel* you need from Levinson's large stocks

. . . when you need it!

Right now Levinson has under cover in stock the largest and most complete selection of the various sizes of steel beams, channels, angles, plates, sheets, and bars in its 52-year history.

If you need any of the above items, pick up your phone and call Pittsburgh, Pennsylvania, Hubbard 1-3200 and tell us what you want and ask for a quotation. You'll find Levinson, as it has in the past, never takes advantage of steel shortages to hike prices. Try Levinson and see—and if you need your steel fabricated, Levinson can do that too. Send your specifications.

**plain or fabricated*

Warehousers, fabricators, designers of steel for over half a century

the LEVINSON STEEL COMPANY

22nd & Wharton Sts., Pittsburgh 3, Pa.

Phone HUbbard 1-3200

"One day we were using 14 hand sprayers ...the next day, 2

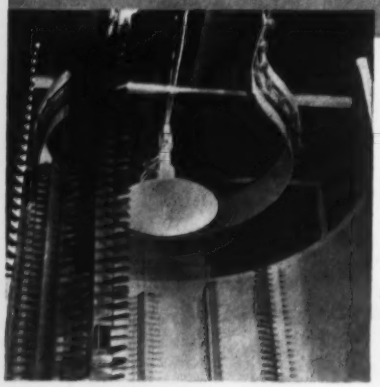
"One day we were using 180 gallons of paint ...the next day, 75

"Fantastic?" "Not exactly. It's a typical, on-the-job-example of the savings made possible with the

RANSBURG NO. 2 PROCESS

Electrostatic Spray Painting

And, in this instance* production was increased; quality of the work improved, and rejections cut to practically nothing.



*Fluorescent Fixtures of California, in their modern plant in South San Francisco, uses the Ransburg No. 2 Process Reciprocating Disc Atomizer to paint their popular line of ALL-BRITE lighting fixtures. The quotes above are from Works Manager, R. H. Shaffer.

Regardless of the type of product you manufacture, if it's painted... and, if your production justifies conveyorized painting, you should look into the savings (and improved quality) which can be yours with one of the Ransburg Electrostatic Painting Processes. May we tell you about complete Ransburg services?

Write to Dept. S

Ransburg ELECTRO-COATING CORP.

Indianapolis 7, Indiana

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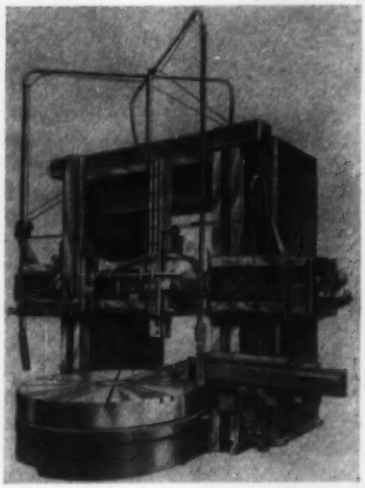
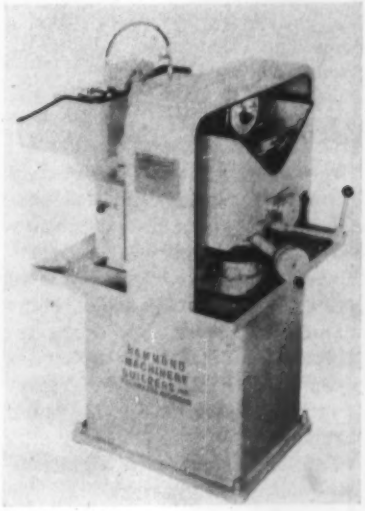


head, and a right-hand side-head with independent motor traverse. *Write*: Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. *Phone*: 9400

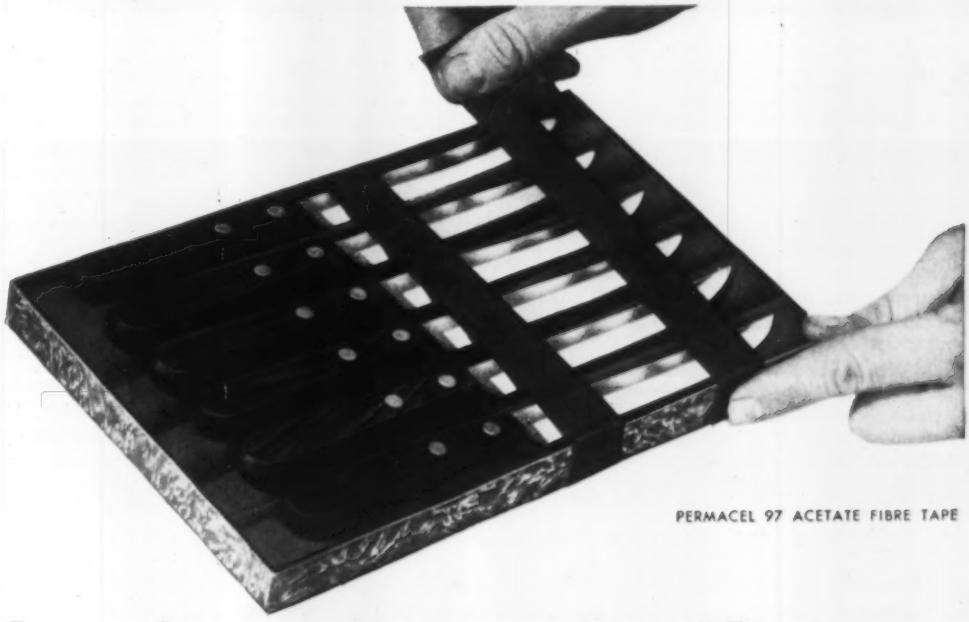
Chip Breaker Grinder

Model CBW-6 is chiefly for heavy-duty, steady production chip breaker grinding, but can be furnished with a cup wheel arrangement. A ½ or 1-hp drive motor uses a V-belt drive. The grinder wheel is 6 in. in diameter.

Table assembly on the chip breaker end reciprocates on ball bearing ways. Length of stroke is adjustable. Vertical and horizontal movements are calibrated to 0.001-in. *Write*: Hammond Machinery Builders Inc., Kalamazoo, Mich. *Phone*: 5-7151



Whatever the job...



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In our complete line, there's a self-sticking tape for every job . . . write Permacel Tape Corporation, New Brunswick, N. J.

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NEW literature

Write directly to the company for a copy

Speed Reducers

Dimensions, weights, parts index, shaft arrangements and ratings are given on a complete series of reducers—catalog 155, 108 pages. Winsmith Inc., Springville, Erie County, N. Y.

Wire Cloth

Information on metals used, weights, grades, gages, plus tables and charts of mesh sizes, are given—catalog 55, 15 pages. Pequot Wire Cloth Co., 35 Hoyt St., Norwalk, Conn.

Crawler Tractor

Covered are design, engineering and operating advantages—form MS-662, 8 pages. Allis-Chalmers Mfg. Co., Tractor Group, Construction Machinery Division, Milwaukee, Wis.

Plating Power Guide

Described is a complete line of selenium rectifiers—12 pages, Dept. PR-2, Messing Corp., 229 Main St., Bellville, N. J.

Stainless Steel Tubing

Described are nickel, nickel alloy and stainless steel tubing in sizes from 1/32 to 1 in. OD—catalog 11, 8 pages. Stainless Steel Products Division, J. Bishop & Co. Platinum Works, Malvern, Pa.

Air Filter Catalog

New methods of air filtration and lubrication are described—16 pages. Master Pneumatic Inc., 20432 Sherwood, Detroit 34, Mich.

Filters

Disc, drum and laboratory filters are described—bulletin FG-B1. Denver Equipment Co., P.O. Box 5268, Denver 17, Colo.

Dry Fluid Drive

Flexidyne drive and coupling and its dry-fluid flow charge are described—bulletin A-640, 12 pages. Dodge Mfg. Co., Mishawaka, Ind.

Forging

Here is information on drop and press forging methods and equipment, production steps, design of forging dies and the characteristics of forgings and forging materials—14 pages. Canadian Steel Improvement Ltd., Horner & Second Ave., Etobicoke, Ont., Canada.

Tool Steels

Properties of tool steels are described in nontechnical language—44 pages. Advertising Dept., Crucible Steel Co. of America, P.O. Box 88, Pittsburgh 30, Pa.

Blast Cleaning

Removing scale and slag from scarfed billets and slabs of stainless steel is described in this case history—4 pages. Wheelabrator Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Vacuum Pumps

Here is an engineering reference book—catalog 425, 52 pages. Kinney Mfg. Division, New York Air Brake Co., 3640 Washington St., Boston 30, Mass.

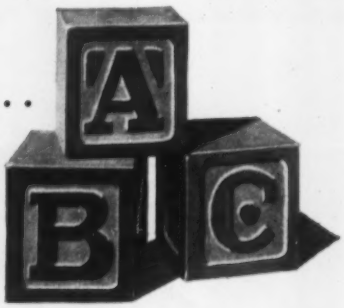
Tool Catalogs

Described and illustrated are dial indicators, dial gages and instruments—bulletin 416, 80 pages. Hacksaws, hole saws, bandsaws and band knives are covered—bulletin 1053, 60 pages. L. S. Starrett Co., Athol, Mass.

Machining Aluminum

Technical data and tooling information for the production of aluminum parts on automatic screw

as basic as . . .



Designed, developed and constructed for maximum versatility, MAY-FRAN conveyor components now provide users with the ultimate of flexibility. Pre-fabricated conveyor sections can be furnished rapidly and inexpensively. Sections can be assembled to form virtually any type of hinged-steel belt conveyor for handling stampings, formed metal parts, forgings, automotive scrap, chips and turnings and many other miscellaneous products.

Straight sections . . . concave or convex curved

Now you can buy CUSTOMIZED conveyors in pre-fabricated STANDARD sections

MAY-FRAN ENGINEERING, INC.

6276-MF

1725 Clarkstone Road • Cleveland 12, Ohio

machines are given—52 pages. Technical Editor, Kaiser Aluminum & Chemical Sales Inc., 228 N. LaSalle St., Chicago 1, Ill.

Lifting Magnet

Here are selection information, size and operating data on circular and rectangular lifting magnets—bulletin 35-C, 8 pages. Stearns Magnetic Inc., 635 S. 28th St., Milwaukee, Wis.

Rotary Files

A wide range of sizes, shapes and cuts of files is pictured—16 pages. Grobet File Co. of America, 421 Canal St., New York 13, N. Y.

Tape Dispensers

Pressure-sensitive tape dispensers, taping machines and types of tape that can be used with each unit are covered—16 pages. Dept. P5-228, Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.

Grinding Wheel Catalog

It contains information on standard wheel marking, shapes, abrasives and all types of grinding wheels and segments—catalog 1-55, 30 pages. Sterling Grinding Wheel Co., P. O. Box 801, Tiffin, O.

Weld Fasteners

Data are given on nuts, brackets, screws and pins for projection and spot welding—catalog 55, 31 pages. Ohio Nut & Bolt Co., 33 First Ave., Berea, O.

Slitter Catalog

Multiple rotary slitters, uncoilers, re-coilers, scrap choppers and coil cars are covered—76 pages. Yoder Co., 5500 Walworth Ave., Cleveland 2, O.

Hoists

Described are a heavy-duty unit for use in the medium-lifting range—bulletin H-37; a rope-controlled wire-rope unit—bulletin H-38; and a wire-rope electric hoist—bulletin H-39. P & H Hoist Division, Harnischfeger Corp., Milwaukee 46, Wis.

Bus-Duct Cable

Cables rated at 600 volts for flexible bus-drop power distribution are covered—4 pages. Anaconda Wire & Cable Co., 25 Broadway, New York, N. Y.

High Vacuum Pumps

Mechanical pumps that handle condensable vapors without loss of pumping speed are described—bulletin P-3. Naresco Equipment Corp., 160 Charlemont St., Newton Highlands 61, Mass.

Nuclear Research

Reactor systems are described and uses in industry are explained—bulletin GEA-6326, 8 pages. General Electric Co., Apparatus Sales Division, Schenectady 5, N. Y.

Three-Phase Welding

Resistance welding and the advantages of direct current at the welding electrodes are described—bulletin 332-10, 4 pages. Public Relations, Dept. L-2, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill.

Induction Furnaces

Here are technical data on a 100-kw, twin-coil, low-frequency melting furnace—pamphlet R-43, 4 pages. A combined holding and automatic pouring unit is featured—pamphlet R-31, 4 pages. Ajax Engineering Corp., Trenton 7, N. J.

Machine Tool Control

How punched business machine cards control machine tools (numerical positioning control) is depicted—bulletin GEA-6328, 4 pages. Also described is automatic positioning of a rotary turret punch press using tabulating cards—bulletin GET-2509, 8 pages. General Electric Co., Schenectady 5, N. Y.

sections . . . take-up and powered end sections can be furnished to meet specific needs as pertain to conveyor belt width, physical limitations as well as required volume and load capacities.

Once installed, a MAY-FRAN conveyor can be dis-assembled and re-assembled in another plant location . . . quickly, easily and with minimum down-time. In addition, conveyors can be lengthened, shortened or modified in almost any way at minimum cost.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with *standardized* components for your *customized* installation.

FOLLANSBEE has been able to maintain its reputation for quality strip steel only by strict control through every phase of production. The steel for your order is yours from the moment Follansbee mill operators begin to fashion it to your specifications.

Your Follansbee representative, knowing that the plant will always deliver a quality order, concentrates on being of service to you. Why not get in touch with him before you place your next order for strip steel.

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Cold Rolled Strip • Terne Roll Roofing • Polished Blue Sheets and Coils

Sales Offices in Principal Cities

Market Outlook

FOURTH-QUARTER availability of steel won't be as poor as it looks.

It appears disheartening because mills restricted their bookings for that period. But mills plan to ship more steel in that quarter than in the third. They are restricting their order intake for the fourth period in an attempt to become current in deliveries. So, even if some consumers couldn't place as big orders for fourth quarter as they wished, they will have steel coming in that period on old orders. Mills are several weeks behind in deliveries.

OVER THE HUMP— The last quarter doesn't have the third-quarter interferences of summer vacations and work-slowing hot weather.

Even though the fourth quarter is three weeks away, steel ingot production is climbing, now that vacations are practically over and cooler weather is here. Ingot output in the week ended Sept. 11 was at 93.5 per cent of capacity. That's a 1-point rise over the preceding week, which was the highest since the end of July.

IMPORTS FREER—Steel consumers can look not only to domestic mills for improved deliveries but also to imports. In the South and Southwest, merchant wire products, special shapes, furring channels and reinforcing bars are a little easier to get from Europe than they have been. This is a result of the rise in domestic prices this summer. European mills, which found business more attractive in other markets, are now able to advance their prices in this country to more profitable levels.

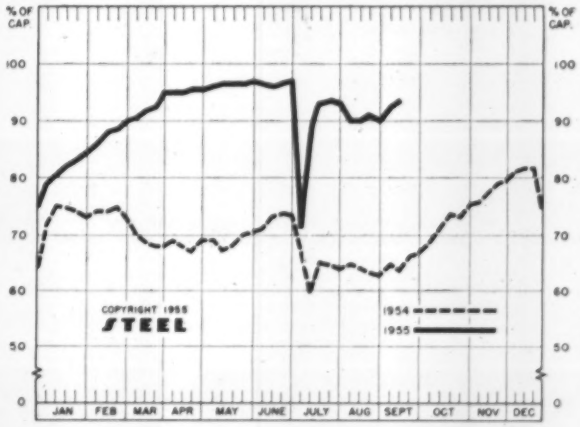
GET MORE, USE MORE—Although steel deliveries should be larger in the fourth quarter, consumption should, too. Metal consuming plants will be past the same obstacles—vacations and hot weather—as the steel mills. Also, the biggest single consumer of steel—the automobile industry—will be in volume production again—after the 1956 models come out.

WATCHING INVENTORIES— Consumers' inventories of steel continue to attract close attention, even though many users say they don't have enough steel. As long as steel deliveries are behind schedule, consumers will continue to order. But as soon as consumers can get steel immediately, what then? It's generally conceded that some steel inventory—although small—has been built up this year. The commercial research manager of one steel company believes it will be six to eight months before such inventories can become worrisome.

MEASURING INVENTORIES—The National Industrial Conference Board reports consumers' steel inventories increased by about 2.3 million tons in the first half of this year. About 1 million tons were accumulated in the first quarter and 1.3 million in the second. These tonnages merely built up working inventories to the higher level required by business, the board points out. The rise is modest compared to the inventory reduction of 15 million tons starting in 1953.

STEADY PRICES—Steel prices remain steady; they are not even affected by the 0.5-cent rise in the price of zinc to 13 cents a pound. The rise in zinc was not enough to push galvanized steel products into the next higher price bracket. STEEL's price composite on finished steel remains at $127.41 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Sept. 11	Change	Same Week 1954	Same Week 1953
Pittsburgh	96.5	+ 1.5*	65.5	93.5
Chicago	96	+ 0.5*	67	100
Mid-Atlantic	94	0	59	97.5
Youngstown	98	+ 2	60	105
Wheeling	93.5	0	70	96
Cleveland	94	— 4*	68	99.5
Buffalo	105	0	56	31.5
Birmingham	93.5	0	68	97
New England	81	+ 9	50	85
Cincinnati	89	— 1.5	52	76
St. Louis	84.5	—20.5	59.5	84.5
Detroit	87.5	0	63.5	104.5
Western	103	0*	78	90
National Rate	93.5	+ 1	63.5	88.5

INGOT PRODUCTION‡

	Week Ended Sept. 11	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	140.9†	140.4	134.3	93.5
NET TONS (In thousands)	2,264†	2,255	2,157	1,502

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 51

Technical Outlook—p. 97

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 6 1955	Aug. 30 1955	Month Ago	Aug. Average
(1947-1949=100)	153.9	153.9	153.9	153.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.200
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	7.993
Tie Plates	5.625	Strip, C.R., Stainless, 430 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.350
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.366
Plates, Carbon	4.950	Pipe, Galv., Buttweld (100 ft)	19.971
Structural Shapes	4.867	Pipe, Line (100 ft)	158.925
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.375	Tubing, Mechanical Stainless, 304 (100 ft)	180.952
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.350	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.660	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.175	Wire, Drawn, Stainless, 430 (lb)	0.578
Bars, C.F., Stainless, 302 (lb)	0.468	Bale Ties (bundle)	6.473
Sheets, H.R., Carbon	5.145	Nails, Wire, 8d Common	8.618
Sheets, C.R., Carbon	6.239	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.690	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless, 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 7 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	207.63	207.63	207.63	194.19	156.99
Index in cents per lb	5.625	5.625	5.625	5.261	4.253

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$127.41	$127.41	$127.41	$117.77	$94.50
No. 2 Fdry. Pig Iron, GT	58.99	58.99	58.99	56.54	46.85
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	45.97
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	47.49
Steelmaking Scrap, GT	44.00	43.83	44.17	29.75	41.08

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point

FINISHED STEEL	Sept. 7 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.45
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.45
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	3.93
Bars, C.F., Pittsburgh	5.90	5.90	5.90	5.10	4.10-4.15
Shapes Std., Pittsburgh	4.60	4.60	4.60	4.25	3.40
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.40
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.46
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.50
Plates, Chicago	4.50	4.50	4.50	4.225	3.50
Plates, Coatesville, Pa.	4.50	4.50	4.50	4.225	3.90
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.50
Plates, Claymont, Del.	4.50	4.50	4.50	4.225	3.90
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.35
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.35
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.30
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.40
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.50
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.25
Strip, C.R., Pittsburgh	6.25-6.45	6.25-6.45	6.25-6.45	5.75	4.15-4.50
Strip, C.R., Chicago	6.35-6.45	6.35-6.45	6.35-6.45	6.00	4.30
Strip, C.R., Detroit	6.35	6.35	6.35	5.60-5.90	4.35-4.95
Wire, Basic, Pittsburgh	6.25	6.25	6.25	5.75	4.50
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$63.00
Wire rods, 7/32-5/8" Pitts.	5.025	5.025	5.025	4.675	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$48.50
Basic, Valley	58.50	58.50	58.50	56.00	46.00
Basic, deld. Phila.	59.16	59.16	59.16	49.66	50.39
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	49.50
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	46.50
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	46.50
No. 2 Fdry, deld. Phila.	59.66	59.66	59.66	50.16	50.89
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	42.38
No. 2 Fdry (B'rm.) deld. Cin.	62.70	62.70	62.70	60.43	49.08
Malleable, Valley	59.00	59.00	59.00	56.50	46.50
Malleable, Chicago	59.00	59.00	59.00	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	190.00†	175.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$43.50	$43.00	$44.50	$30.50	$44.00
No. 1 Heavy Melt, E. Pa.	46.50	46.50	46.00	28.75	39.25
No. 1 Heavy Melt, Chicago	42.00	42.00	42.00	30.00	40.00
No. 1 Heavy Melt, Valley	46.50	46.50	46.50	30.50	43.75
No. 1 Heavy Melt, Cleve.	44.00	44.00	41.00	28.50	41.25
No. 1 Heavy Melt, Buffalo	39.50	39.50	39.50	26.50	39.75
Rails, Rerolling, Chicago	64.50	64.50	64.50	44.50	59.50
No. 1 Cast, Chicago	46.50	46.50	45.50	35.50	49.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$13.625	$13.625	$13.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	15.50
Oven, Fdry, Chicago	25.75	25.75	25.75	24.50	21.00

Daily Nonferrous Price Record

	Price Sept. 7	Last Change	Previous Price	Aug. Avg.	July Avg.	Sept. 1954 Avg.
Copper	43.00	Sept. 1, 1955	40.00-43.00	37.759	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	14.400
Zinc	13.00	Sept. 6, 1955	12.50	12.500	12.500	11.900
Tin	95.625	Sept. 7, 1955	95.25	96.519	97.045	93.545
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	24.40	Aug. 8, 1955	23.20-24.40	24.267	23.200	22.200
Magnesium	32.50	Aug. 16, 1955	28.50	30.574	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL; electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

"Samples from the Furnaces." Agnes Potter Lowrie, famed artist daughter of a noted steelmaker, portrays a closeup of familiar objects at testing time: the protective blue glasses through which old-timers visually estimated temperatures; the slag spoon and mold for physical and chemical control of steel quality.

The Fine Art of Steel Making

Why, during World War II, were American steel makers with the greatest production capacity in the world fearful of shutdowns?

The Achilles Heel of the industry was palm oil. Then considered the essential lubricant for cold rolling tin plate, palm oil was obtainable only from foreign sources and had to be shipped halfway around the world.

That this danger has now been eliminated is due to the ingenuity of American research coupled with the readiness of steelmen to adopt new and better products and processes.

Almost 3 years ago Ironsides announced Palmoshield as the first domestic replacement for imported palm oil. Within six months two-thirds of our major tin plate mills were using or testing it, often with remarkable results. For example, one company stepped up production 15% with no additional investment, no increase in labor, and no change in mill operation.

Recognized as today's most significant advance in lubrication, Palmoshield offers five distinct advantages:

1. Produced in the heart of the steel industry. Users need not stockpile.
2. Made from freely available domestic materials.
3. Subject to exact chemical control—free fatty acid content to within ¼%.
4. Price is not artificial, but fluctuates freely with the domestic fat market.
5. Proved in production to deliver increased tonnage at less cost.

Ironsides research, which developed Palmoshield, is now geared to the future. A flexible team—the "custom tailors" of lubrication—Ironsides engineers are available for technical assistance on special problems of any nature or size. A letter will summon them without obligation. Address The Ironsides Company, Columbus 16, Ohio.

SHIELD PRODUCTS

Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

Nonferrous Metals

Zinc producers surprise market with third price increase this year. It puts the squeeze on diecasters but will not affect the price of galvanized steel

Nonferrous Metal Prices, Pages 144 & 145

ZINC stole the spotlight from copper in the nonferrous industry when producers advanced the price 0.5 cent for the third time this year, making the current level of prime western 13.00 cents a pound, East St. Louis.

Immediate reaction of users was surprise. Since the price was last advanced on June 16, there has been on-and-off speculation as to whether the market could stand another half cent and when it might come. Perhaps preoccupation with the copper situation lulled observers into a status quo frame of mind about zinc. In any case, there was no forewarning of the action which came after Labor day.

Goal—At last lead and zinc producers have reached the price goal which they claim will allow them to develop their industry at a profit. The combined lead-zinc price of 28 cents often has been mentioned as the level which must be attained if this country is to have a thriving mining industry which can be called on in an emergency. Supposedly that price was needed to put into production some low-cost mines.

It was evident as early as the combined lead and zinc industry conventions in April—when the price of lead was 15.00 and zinc was 12.00 cents—that this combination price would be achieved sooner or later. One producing official correctly called the 12.50-cent zinc price that came on June 16 and then said there was no reason he knew of why it shouldn't go to 13 cents.

Now What?—Users of the metal are wondering what will happen to their operations with this increased cost. Diecasters are especially worried. They have been operating on a fairly thin profit margin for some time in order to make their products more attractive to the No. 1 market, automakers. They have been pushed into a highly competitive situation by the aluminum industry, which lately is making no bones about the expected increase in use of aluminum in autos in 1956. Zinc diecasters had hoped for increased use of their own products in autos, based to a large extent on lower unit costs. Now they're not so certain.

You won't notice any increase in the cost of galvanized steel. The zinc price rise was not enough to carry galvanized products into the next higher price bracket. If zinc were to go over 13 cents a pound, galvanized pipe would move to the next higher bracket on the schedule. If it were to go over 13.50 cents a pound, galvanized sheet would move up to the next bracket.

STEEL's Metal Price Averages for Aug., 1955

(Cents per lb)

Electrolytic Copper, deld. Connecticut	37.759
Lead, St. Louis	14.800
Prime Western Zinc, E. St. Louis, Ill.	12.500
Straits Tin, New York	96.519
Primary Aluminum Ingots, deld.	24.267
Magnesium, Freeport, Tex.	30.574
Nickel, f.o.b. refinery	64.500

Diecasters Watch Developments

Diecasters are watching several developments regarding aluminum which will assure them of continued business regardless of what happens in the competitive picture. One is a casting ingot that can be anodized. If a suitable alloy is perfected, the automotive industry will probably be a big customer for aluminum in interior trim and hardware. Rumor has it that such an ingot is practical now, but the aluminum industry is in no position to market it with supply being so tight.

Another development is the search for better die material to produce aluminum diecastings with better surface. Research is in the advanced stage on this project. Third, work is progressing on a hot-chamber machine which will successfully diecast aluminum. Researchers know that certain metals are impervious to attack by molten aluminum and are working with alloys of those metals. If one doesn't work, they are confident that another will. One industry official says he wouldn't be surprised to see one to three of these developments come within the next five years.

Meantime, the American Die Casting Institute has estimated that diecasters will use about 500 million lb of aluminum in 1957 if the growth pattern does nothing more than follow its present course. This year will see a figure of between 380 million and 400 million lb for casting and alloying while 1956 should rise to 450 million lb. If any of the developments above become practical within that time, the growth curve would take a sharp upturn. Problems of supply will plague the industry for a while, though. They can't get that much metal from the secondary industry, and the primary producers are already having enough trouble supplying historical users of virgin metal.

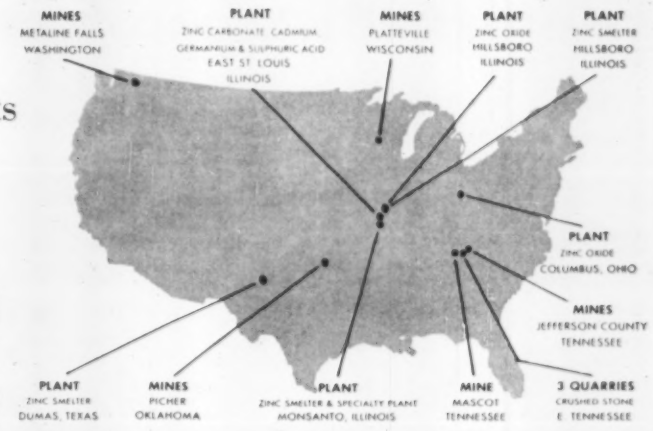
Pressure Is Still on Copper

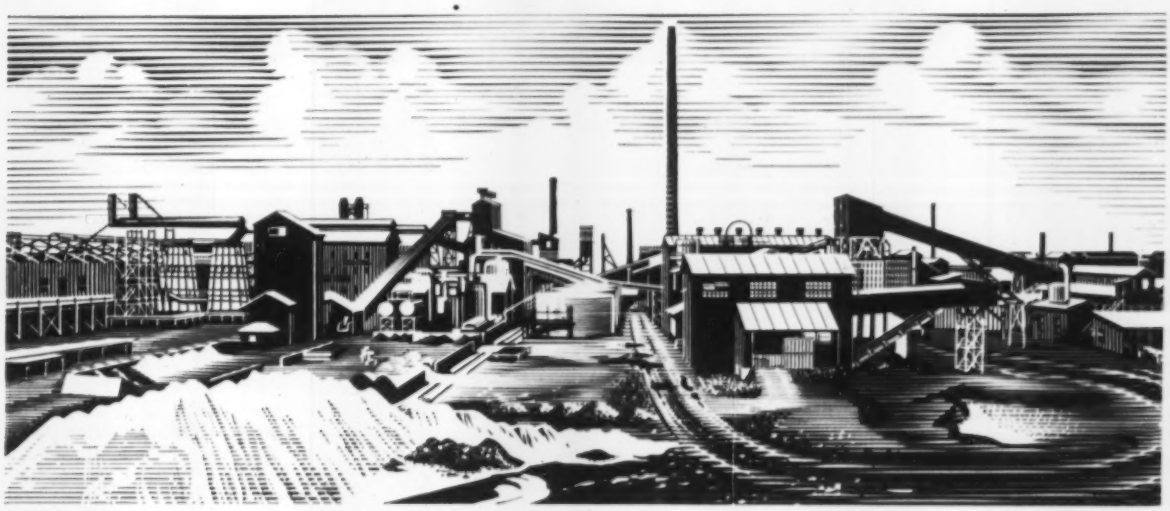
Copper did not drop completely out of the news, although the pace of developments did settle down once Kennecott Copper Corp. joined the rest of the producers at 43 cents a pound. The continuing pressure from higher scrap prices and a strong foreign market at 50 cents a pound is causing talk of further price increases for domestic copper. But major producers have gone on record against any further hikes, as they did once or twice before this year. There is no denying that each price increase has been a bitter pill for the producers to swallow. So far they have stuck together and avoided, for the most part, a dual pricing system for domestic primary copper. However, if the price advances any further, and it could, don't take any bets that it will be across the board. Producers have gotten to the point where they may take the attitude that it's six one way and half a dozen the other.

Market Memos

- Better watch your metal shipments. Reports of thefts in transit are increasing. It seems a coil of copper nowadays is good as gold.
- After 16 months of road testing, Eastman Chemical Products Inc., New York, and Egyptian Lacquer Co., South Kearney, N. J., have come up with a new clear, water-white, weather resistant, protective coating called Clear Coating-CH64 for use on aluminum paneled trucks, busses or trains.

American Zinc and its products *from* A *to* Z





FAIRMONT CITY, ILLINOIS
(East St. Louis)

Operations include: roasting and sintering of zinc concentrates; cadmium plant producing commercial balls, sticks and plates; zinc carbonate plant; germanium plant producing germanium dioxide for the electronics industry. Sulphuric acid is produced by both the Chamber and Contact methods. For complete picture of American Zinc operations, see map above.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD-FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

Distributors for

American Zinc Sales Company

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 24.40, pigs 22.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.2; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 27.80; No. 195, 4.5% Cu, 0.8% Si, 27.20; No. 214, 3.8% Mg, 27.7; No. 356, 7% Si, 0.3% Mg, 26.1.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; Lake 43.00 deld.; Fire refined, 42.75 deld.

Germanium: 99.9% $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$110 nom. per troy oz.

Lead: Common, 14.80, chemical, 14.90, corroding, 14.90, St. Louis. New York basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig, 32.50; notched ingot, 33.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingots; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, $3-$3.25 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $80-$90 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $9-$10 per lb.

Silver: Open market, 90.75 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 95.625; prompt, 95.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.95, grade A-2 (0.5% Fe max), $3.50 per pound.

Tungsten: Powder, 98.8%, carbon, reduced, 1000-lb lots, $4.50 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 13.00; brass special, 13.25; intermediate, 13.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 14.35; special high grade, 14.50, deld. Diecasting alloy ingot No. 3, 17.25; No. 2, 18.25; No. 5, 17.75, deld.

Zirconium: Ingots, commercial grade, 14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $10 per lb. Powder electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 31.25-33.00; No. 12 foundry alloy (No. 2 grade), 30.00-30.75; 5% silicon alloy, 0.60 Cu max, 31.00-32.25; 13 alloy, 0.60 Cu max, 31.50-32.25; 195 alloy, 31.75-32.25; 108 alloy, 30.00-30.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 30.75; grade 2, 29.75; grade 3, 29.00; grade 4, 28.50.

Brass Ingot: Red brass No. 115, 42.50; tin bronze No. 225, 56.50; No. 215, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 34.75; manganese bronze No. 421, 38.25.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l., 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $20 per cwt; pipe, full coils, $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.00-20.50; plates, 19.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	...	65	...

ALUMINUM

Screw Machine Stock: 30.000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

ALUMINUM

Sheets and Circles: 110 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	37.5	42.3	...	...
0.135-0.096	38.0	43.2	...	...
0.095-0.077	38.7	44.2	36.1	41.3
0.076-0.061	39.3	45.1	36.3	41.5
0.060-0.048	39.9	45.6	36.7	42.0
0.047-0.038	40.4	46.5	37.2	42.4
0.037-0.030	40.8	47.0	37.6	43.1
0.029-0.024	41.4	47.5	37.9	43.8
0.023-0.019	42.2	49.0	38.8	44.5
0.018-0.017	43.0	...	39.4	45.4
0.016-0.015	43.9	...	40.2	46.6
0.014	44.9	...	41.2	47.9
0.013-0.012	46.1	...	41.9	48.9
0.011	47.1	...	43.1	50.5
0.010-0.0095	48.4	...	44.3	52.2
0.009-0.0085	49.7	...	45.8	54.3
0.008-0.0075	51.3	...	47.0	56.1
0.007	52.8	...	48.5	58.4
0.006	54.4	...	49.9	63.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam. 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.10, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.85	2	$ 51.95
1	26.50	4	143.00
1¼	35.85	6	256.70
1½	42.90	8	386.30

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in., 99c; 0.064 in., 78.00c; 0.125 in., 63.50c, 30,000 lb and over, f.o.b. mill.

Plate: AZ31, 61.00c, 30,000 lb or more, 0.250 in. and over, widths 24-60 in., lengths 72-180 in.; tread plate, 64.00c, 30,000 lb or more, ¼-in. thick, widths 24-60 in., lengths 60-192 in.; tooling plate, 66.00c, 30,000 lbs or more, .250-3.000 in., widths 60-72 in., lengths 72-180 in.

Extrusions: AZ31 commercial grade, rectangles, ¼ x 2 in., 64.70c; 1 x 4 in., 69.50c. Rod, 1 in., 61.50c; 2 in., 59.00c. Tubing, 1 in. OD x 0.065 in., 82.50; Angles, 1 x 1 x ⅛-in., 68.40c; 2 x 2 x ⅛-in., 62.50c. Channels, 8 in., 63.40c. I-beams, 5 in., 62.70c.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 18.50-19.50; old sheets, 15.00-17.50; borings and turnings, 10.50-11.50; crankcases, 15.50-17.50; industrial castings, 14.50-17.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	62.76b	60.36c	....	62.82	39.000	39.000	38.250
Yellow Brass	52.27	42.41d	52.81	55.18	28.875	28.625	26.750
Red Brass, 85%	58.09	58.03	58.63	60.90	34.250	34.000	33.500
Low Brass, 80%	56.55	56.49	57.09	59.36	32.750	32.250	31.750
Naval Brass	55.63	49.94	62.69	58.79	26.750	26.500	26.000
Com. Bronze, 90%	60.18	60.12	60.72	62.74	35.750	35.500	35.000
Nickel Silver, 10%	66.00	68.33g	68.33	....	32.500	32.250	16.250
Phos. Bronze, A, 5%	80.99	81.49	81.49	82.67	39.250	39.000	38.000
Silicon Bronze	66.54	65.73	66.58	68.68e	37.625	37.375	36.875
Manganese Bronze	59.37	53.38	63.82	....	27.000	26.750	25.750
Muntz Metal	53.74	49.55	....	....	27.000	26.750	26.250

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 38.00-38.50; No. 2 heavy copper and wire, 37.00-37.50; light copper, 35.00-35.50; No. 1 compos.tion red brass, 29.50-30.00; No. 1 composit.on turnings, 28.50-29.00; yellow brass turnings, 18.50-19.00; new brass clippings, 25.00-25.50; light brass, 18.50-19.00; heavy yellow brass, 22.00-22.50; new brass rod ends, 23.50-24.00; auto radiators, unsweated, 23.00-23.50; cocks and faucets, 24.50-25.00; brass pipe, 25.50-26.00.

Lead: Heavy, 11.50-12.00; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.25; electrotype, 12.00-12.50; mixed babbitt, 14.50.

Magnesium: Clippings, 18.50-19.50; **clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.**

Monel: Clippings, 44.50; old sheets, 40.00; turnings, 34.00; rods, 44.50.

Nickel: Sheets and clips, 82.00-92.00; rolled anodes, 82.00-92.00; turnings, 65.00-75.00; rod ends, 82.00-92.00.

Zinc: Old zinc, 5.00-5.50; new die-cast scrap, 5.00-5.50; old die-cast scrap, 3.50-3.75.

REFINERS' BUYING PRICES

(Cents per pound, cariots, delivered refinery)

Aluminum: 1100 clippings, 22.00-22.50; 3003 clippings, 21.75-22.50; 6151 clippings, 21.50-22.50; 5052 clippings, 21.50-22.50; 2014 clippings, 21.00; 2017 clippings, 21.00; 2024 clippings, 21.00; mixed clippings, 21.00-21.50; old sheet, 18.50-19.00; old cast, 18.50-19.00; clean old cable (free of steel), 21.50-22.50; borings and turnings, 18.50-20.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 54.00; light scrap, 49.00;turnings and borings, 39.00.

Copper and Brass: No. 1 copper and wire, 42.50-43.00; No. 2 copper and wire, 41.00; light copper, 38.75; refinery brass (60% copper) per dry copper content, 37.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, cariots, delivered)

Copper and Brass: No. 1 copper and wire, 42.50-43.00; No. 2 copper and wire, 41.00; light copper, 38.75; No. 1 composition borings, 33.50-34.00; No. 1 composit.on solids, 34.00-34.50; heavy yellow brass solids, 24.00-25.50; yellow brass turnings, 23.00-25.00; radiators, 26.00-27.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 59.42, oval, 58.92, 5000-10,000 lb; electrodeposited, 54.28, 2000-5000 lb lots; cast 62.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab less than 200 lb, $1.135; 200-499 lb, $1.12; 500-999 lb, $1.115; 1000 lb or more, $1.11.

Zinc: Bar, 21.00; bar or flat top, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 76.80; 200 lb, 76.05; 300 lb, 75.80; 400-900 lb, 75.05; 1000 lb and over, 73.05; effective Mar. 24, 1955.

Copper Sulphate: Crystal, 100 lb, 21.50; 200 lb, 18.50; 300 lb, 17.50; 400 lb, 17.00; 500-1900 lb, 15.50; 2000-10,000 lb, 15.25; 10,000 lb and up, 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 72.00; 100-600 lb, 57.60; 700-1900 lb, 55.20; 2000-9900 lb, 53.40; 10,000 lb or more, 52.30.

Stannous Chloride (Anhydrous): Less than 50 lb, $1.582; 50 lb, $1.242; 100-300 lb, $1.092; 400-900 lb, $1.068; 1000-1900 lb, $1.043; 2000-4900 lb, $1.006; 5000-19,900 lb, 94.60; 20,000 lb or more 88.50.

Stannous Sulphate: Less than 50 lb, $1.281; 50 lb, 98.10; 100-1900 lb, 96.10; 2000 lb or more, 94.10.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

There's *this* about "Fischer Turned" BRASS AND ALUMINUM NUTS

CLASS 2 PRECISION THREADS

COUNTERSUNK BOTH SIDES

TAPPED THROUGH & SQUARE WITH FACE

BURRLESS

CLEANED AND DEGREASED

PROMPT DELIVERY

All nuts are not the same. Fischer brass and aluminum nuts, for example, are *precision turned*... making possible new economies in assembly operations.

You pay no premium for this extra quality... Fischer *turned* nuts cost no more than those produced by other, less accurate methods.

A complete range of standard types and sizes is stocked at the factory... "specials" are produced quickly and inexpensively.

1905 1955 50th ANNIVERSARY FISCHER SPECIAL MFG. CO. CINCINNATI OHIO

Fischer SPECIAL MFG. CO.

476 Morgan St.
Cincinnati 6, Ohio

Write today for complete catalog

C-271-FS

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 147. Key to footnotes, page 149.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)
Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall,Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS
Carbon, rerolling (NT)
Aliquippa,Pa. J5 .....$68.50
Bessemer,Pa. U5 .....68.50
Bridgeport,Conn. N19 ..73.50
Buffalo R2 .....68.50
Clairton,Pa. U5 .....68.50
Ensley,Ala. T2 .....68.50
Fairfield,Ala. T2 .....68.50
Fontana,Calif. K1 .....76.00
Gary,Ind. U5 .....68.50
Johnstown,Pa. B2 .....68.50
Lackawanna,N.Y. B2 ..68.50
LoneStar,Tex. L6 .....74.50
Munhall,Pa. U5 .....68.50
Pittsburgh J5 .....68.50
S.Chicago,Ill. R2, U5 ..68.50
S.Duquesne,Pa. U5 ...68.50
Youngstown R2 .....68.50

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$84.50
Bessemer,Pa. U5 .....84.50
Bridgeport,Conn. N19 ..89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3 ..89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana,Calif. K1 .....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houston S5 .....89.50
Johnstown,Pa. B2 .....84.50
Lackawanna,N.Y. B2 ..84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14 ..84.50
S.Duquesne,Pa. U5 ....84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 $96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 .....96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ....96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2, W14 ...103.50
S.Duquesne,Pa. U5 ...103.50

SKELP
Aliquippa,Pa. J5 .....4.325
LoneStar,Tex. L6 .....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ...4.225

WIRE RODS
AlabamaCity,Ala. R2 ..5.025
Aliquippa,Pa. J5 .....5.025
Alton,Ill. L1 .....5.20
Buffalo B11, W12 .....5.025
Cleveland A7 .....5.025
Donora,Pa. A7 .....5.025
Fairfield,Ala. T2 .....5.025
Houston S5 .....5.275
IndianaHarbor,Ind. Y1 .5.025
Johnstown,Pa. B2 .....5.025
Joliet,Ill. A7 .....5.025
KansasCity,Mo. S5 ....5.275
Kokomo,Ind. C16 .....5.125
LosAngeles B3 .....5.825
Minnequa,Colo. C10....5.275
Monessen,Pa. P7 .....5.025
N.Tonawanda,N.Y. B11..5.025
Pittsburg,Calif. C11 ...5.675
Portsmouth P12 .....5.025
Roebling,N.J. R5 .....5.125
S.Chicago,Ill. R2 .....5.025
SparrowsPoint,Md. B2..5.125
Sterling,Ill.(1) N15 ....5.025
Sterling,Ill. N15 .....5.125
Struthers,O. Y1 .....5.025
Worcester,Mass. A7 ...5.325

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala. T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....4.60
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 .....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown,Pa. B2 .....4.65
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 .....5.35
Phoenixville,Pa. P4 ....5.15
Seattle B3 .....5.35
S.Chicago U5, W14 .....4.60
S.SanFrancisco B3 .....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 .....4.60

Wide Flange
Bethlehem,Pa. B2 .....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 .....5.40
Lackawanna,N.Y. B2 ...4.65
Munhall,Pa. U5 .....4.60
Phoenixville,Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes
Clairton,Pa. U5 .....5.65
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....5.65
Houston S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. i-2, Y1.6.75
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....6.85
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 .....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.80
Lackawanna,N.Y. B2 ...6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....4.65
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ...5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland,Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport,Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa. U5 .....4.50
Claymont,Del. C22 .....4.50
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ...4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 .....4.70
Harrisburg,Pa. C5 .....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1.4.50
Johnstown,Pa. B2 .....4.50
Lackawanna,N.Y. B2 ...4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa,Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.50
Seattle B3 .....5.40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14.4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ....4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 .....4.50
Youngstown R2, U5, Y1.4.50

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 .....10.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.725
Bessemer,Ala. T2 .....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 .....6.725
Coatesville,Pa. L7 ....6.725
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1..7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
LosAngeles B3 .....7.625
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago,Ill. U5, W14.6.725
SparrowsPoint,Md. B2..6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy
Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 .....6.30
Coatesville,Pa. L7 .....6.30
Fontana,Calif. K1 .....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES
Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. C5 ....5.575
Ind.Harbor,Ind. I-2 ...5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 .....5.575

PLATES, Ingot Iron
Ashland c.l. (15) A10...4.75
Ashland l.c.l. (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 .....5.10

BARS

BARS, Hot-Rolled Carbon
Ala.City,Ala. R2 .....4.65
Aliquippa,Pa. J5 .....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala. T2 .....4.65
Birmingham C15 .....4.65
Bridgeport,Conn. N19 ...4.80
Buffalo R2 .....4.65
Canton,O. R2 .....4.75
Clairton,Pa. U5 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
Fairless Hills,Pa. U5 ..4.80
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.65
Houston S5 .....4.90
Ind.Harbor,Ind. I-2, Y1.4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.65
Pittsburg,Calif. C11 ...5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago R2, U5, W14..4.65
S.Duquesne,Pa. U5 .....4.65
S.SanFran.,Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Warren,O. R2 .....4.65
Weirton,W.Va. W6 .....4.65
Youngstown R2, U5 ....4.65

BARS, H.R. Loaded Alloy
Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....5.575
Bridgeport,Conn. N19 ..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 .....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fontana,Calif. K1 .....6.625
FairlessHills,Pa. U5 ..5.725
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2, Y1.5.575
Johnstown,Pa. B2 .....5.575
KansasCity,Mo. S5 ....5.825
Lackawanna,N.Y. B2 ...5.575
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland,Pa. C18 .....5.575
S.Chicago R2, U5, W14.5.575
S.Duquesne,Pa. U5 ....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1 ..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 .....6.80
S.SanFrancisco B3 .....7.55
Struthers,O. Y1 .....6.80
Warren,O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....5.05

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.65
Gary,Ind. U5 .....5.65
Houston S5 .....5.90
KansasCity,Mo. S5 .....5.90
Youngstown U5 .....5.65

BARS, C.F. Loaded Alloy
Ambridge,Pa. W18 ....8.325
Camden,N.J. P13 .....8.50
Chicago W18 .....8.325
Cleveland C20 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
SpringCity,Pa. K3 .....8.50
Warren,O. C17 .....8.325

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.90
BeaverFalls,Pa. M12,R2.5.90
Buffalo B5 .....5.95
Camden,N.J. P13 .....6.35
Carnegie,Pa. C12 .....5.90
Chicago W18 .....5.90
Cleveland A7, C20 .....5.90
Detroit R7 .....5.90
Detroit B5, P17 .....6.10
Donora,Pa. A7 .....5.90
Elyria,O. W8 .....5.90
FranklinPark,Ill. N5 ....5.90
Gary,Ind. R2 .....5.90
GreenBay,Wis. F7 .....5.90
Hammond,Ind. L2, M13.5.90
Hartford,Conn. R2 .....6.40
Harvey,Ill. B5 .....5.90
LosAngeles R2, S30 ....7.35
Mansfield,Mass. B5 ....6.45
Massillon,O. R2, R8 ....5.90
Midland,Pa. C18 .....5.90
Monaca,Pa. S17 .....5.90
Newark,N.J. W18 .....6.35
NewCastle,Pa.(17) B4 ..5.90
Pittsburgh J5 .....5.90
Plymouth,Mich. P5 .....6.15
Putnam,Conn. W18 .....6.45
Readville,Mass. C14 .....6.45
S.Chicago,Ill. W14 .....5.90
SpringCity,Pa. K3 .....6.35
Struthers,O. Y1 .....5.90
Waukegan,Ill. A7 .....5.90
Worcester,Mass. W19 ...6.35
Youngstown F3, Y1 ....5.90

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md. C19 ...5.15

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....7.425
BeaverFalls,Pa.M12,R2 7.425
Bethlehem,Pa. B2 .....7.425
Buffalo B5 .....7.425
Camden,N.J. P13 .....7.60
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....7.425
Chicago W18 .....7.425
Cleveland A7, C20 .....7.425
Detroit R7 .....7.425
Detroit B5, P17 .....7.625
Donora,Pa. A7 .....7.425
Elyria,O. W8 .....7.425
Gary,Ind. R2 .....7.425
GreenBay,Wis. F7 .....7.425
Hammond,Ind. L2, M13.7.425
Hartford,Conn. R2 .....7.725
Harvey,Ill. B5 .....7.425
Lackawanna,N.Y. B2 ..7.425
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ...7.725
Massillon,O. R2, R8 ...7.425
Midland,Pa. C18 .....7.425
Monaca,Pa. S17 .....7.425
Newark,N.J. W18 .....7.60
Plymouth,Mich. P5 .....7.625
S.Chicago W14 .....7.425
SpringCity,Pa. K3 .....7.60
Struthers,O. Y1 .....7.425
Warren,O. C17 .....7.425
Waukegan,Ill. A7 .....7.425
Worcester,Mass. A7 ...7.725
Youngstown F3, Y1 ...7.425

BARS, Reinforcing
(To Fabricators)
Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....4.65
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ....4.80
Fontana,Calif. K1 .....5.35
Ft. Worth,Tex.(42) T4 ..5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

Ind.Harbor,Ind. I-2, Y1 4.65
Johnstown,Pa. B2 ..... 4.65
Joliet,Ill. P22 ..... 4.65
KansasCity,Mo. S5 .... 4.90
Lackawanna,N.Y. B2 .. 4.65
LosAngeles B3 ..... 5.35
Milton,Pa. M18 ..... 4.65
Minnequa,Colo. C10 .... 5.10
Niles,Calif. P1 ..... 5.00
Pittsburg,Calif. C11 .... 5.35
Pittsburgh J5 ..... 4.65
Portland,Oreg. O4 ..... 5.40
SandSprings,Okla. S5 .. 5.15
Seattle B3, N14 ..... 5.40
S.Chicago R2 ..... 4.65
S.Duquesne,Pa. U5 .... 4.65
S.SanFrancisco B3 ..... 5.40
SparrowsPoint,Md. B2 .. 4.65
Sterling,Ill.(1) N15 .... 4.65
Sterling,Ill. N15 ..... 4.75
Struthers,O. Y1 ..... 4.65
Torrance,Calif. C11 .... 5.35
Youngstown R2, U5, Y1 4.65

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 6.15
KansasCity,Kans. S5 ... 6.45
Lackawanna,N.Y. B2 .. 6.17
Marion,O. P11 ..... 5.90
Pittsburgh U8 ..... 6.17
Seattle B3, N14 ..... 6.60
SparrowsPt. ½-1" B2 .. 6.15
Williamsport,Pa. S19 .. 6.00

RAIL STEEL BARS

Avis,Pa.(3) J8 ..... 4.25
ChicagoHts.(3) C2, I-2 .. 4.55
ChicagoHts.(4) C2, I-2 .. 4.65
Ft.Worth,Tex.(26) T4 .. 4.95
Franklin,Pa.(3) F5 .... 4.55
Franklin,Pa.(4) F5 .... 4.65
Marion,O.(3) P11 ..... 4.50
Moline,Ill.(3) R2 ..... 4.65
Tonawanda(3) B12 .... 4.50
Tonawanda(4) B12 .... 4.65
Williamsport,Pa.(3) S19 4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt) B14 14.65
McK.Rks.(S.R.) L5 ... 11.50
McK.Rks.(D.R.) L5.... 16.00
McK.Rks.(Staybolt) L5 .17.00

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 ..... 4.325
Allenport,Pa. P7 ..... 4.325
Ashland,Ky.(8) A10 ... 4.325
Cleveland J5, R2 ..... 4.325
Conshohocken,Pa. A3 .. 4.375
Detroit(8) M1 ..... 4.425
Dravosburg,Pa. U5 .... 4.325
Ecorse,Mich. G5 ..... 4.425
Fairfield,Ala. T2 .... 4.325
FairlessHills,Pa. U5 ... 4.375
Fontana,Calif. K1 ..... 5.075
Gary,Ind. U5 ..... 4.325
Geneva,Utah C11 ..... 4.425
GraniteCity,Ill. G4 .... 4.525
Ind.Harbor,Ind. I-2, Y1 4.325
Kokomo,Ind. C16 ..... 4.425
Lackawanna,N.Y. B2 .. 4.325
Mansfield,O. E6, (37).. 4.325
Munhall,Pa. U5 ..... 4.325
Newport,Ky.(8) N9 ... 4.325
Niles,O. N12 ..... 4.325
Pittsburg,Calif. C11 ... 5.025
Pittsburgh J5 ..... 4.325
Portsmouth,O. P12 .... 4.325
Riverdale,Ill. A1 ..... 4.325
Sharon,Pa. S3 ..... 4.325
S.Chicago,Ill. W14 .... 4.325
SparrowsPoint,Md. B2 .. 4.325
Steubenville,O. W10 ... 4.325
Warren,O. R2 ..... 4.325
Weirton,W.Va. W6 .... 4.325
Youngstown U5, Y1 ... 4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 ..... 5.625
Kokomo,Ind. C16 .... 5.475
Niles,O. N12 ..... 5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 .... 7.20
Youngstown Y1 ..... 7.20

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .... 6.375
Conshohocken,Pa. A3 .. 6.425
Dravosburg,Pa. U5 .... 6.375
Ecorse,Mich. G5 ..... 6.475
Fairfield,Ala. T2 ..... 6.375
FairlessHills,Pa. U5 ... 6.425
Fontana,Calif. K1 .... 7.125
Gary,Ind. U5 ..... 6.375
Ind.Harbor,Ind. Y1, I-2 6.375
Lackawanna(35) B2 ... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
Sharon,Pa. S3 ..... 6.375
S.Chicago,Ill. U5 .... 6.375
SparrowsPoint(36) B2.. 6.375
Warren,O. R2 ..... 6.375
Weirton,W.Va. W6 .... 6.375
Youngstown U5, Y1 ... 6.375

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ... 4.575
Cleveland R2 ..... 4.925
Ind.Harbor,Ind. I-2 ... 4.575
Warren,O. R2 ..... 4.925

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 ..... 5.325
Cleveland J5, R2 ..... 5.325
Conshohocken,Pa. A3 .. 5.375
Dravosburg,Pa. U5 .... 5.325
Detroit M1 ..... 5.325
Ecorse,Mich. G5 ..... 5.425
Fairfield,Ala. T2 ..... 5.325
FairlessHills,Pa. U5 ... 5.375
Follansbee,W.Va. F4 ... 5.325
Fontana,Calif. K1 .... 6.425
Gary,Ind. U5 ..... 5.325
GraniteCity,Ill. G4 .... 5.525
Ind.Harbor,Ind. I-2, Y1 5.325
Lackawanna,N.Y. B2 .. 5.325
Mansfield,O. E6 ..... 5.325
Middletown,O. A10 .... 5.325
Newport,Ky. N9 ..... 5.325
Pittsburg,Calif. C11 ... 6.275
Pittsburgh J5 ..... 5.325
Portsmouth,O. P12 .... 5.325
SparrowsPoint,Md. B2.. 5.325
Steubenville,O. W10 ... 5.325
Warren,O. R2 ..... 5.325
Weirton,W.Va. W6 .... 5.325
Youngstown Y1 ..... 5.325

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 ..... 7.875
Dravosburg,Pa. U5 .... 7.875
Ecorse,Mich. G5 ..... 7.975
FairlessHills,Pa. U5 .. 7.925
Fontana,Calif. K1 .... 8.975
Gary,Ind. U5 ..... 7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ... 7.875
Pittsburgh J5 ..... 7.875
SparrowsPoint(38) B2.. 7.875
Warren,O. R2 ..... 7.875
Weirton,W.Va. W6 .... 7.875
Youngstown Y1 ..... 7.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 ..... 5.925
Middletown,O. A10 .... 5.825
Warren,O. R2 ..... 5.925

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.90	...
Canton,O. R2	6.10	6.55
Dravosburg U5	6.10	...
Fairfield T2	6.10	...
Gary,Ind. U5	6.10	6.35
Ind.Harbor I-2	6.10	6.35
Kokomo,Ind. C16	6.20	...
MartinsFry. W10	6.10	...
Newport,Ky. N9	6.10	6.35
Pitts.,Calif. C11	6.85	...
SparrowsPt. B2	6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 ..... 7.15
Gary,Ind. U5 ..... 5.95
MartinsFry,O. W10 .... 6.35

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 ..... 5.85‡
Ashland,Ky. A10 ..... 5.85‡
Canton,O. R2 ..... 5.85‡
Delphos,O. N16 ..... 6.60‡
Dover,O. R1 ..... 5.85‡
Dravosburg,Pa. U5 .... 5.85‡
Fairfield,Ala. T2 .... 5.85‡
Gary,Ind. U5 ..... 5.85*
GraniteCity,Ill. G4 .... 6.05
Ind.Harbor,Ind. I-2 ... 5.85‡
Kokomo,Ind. C16 .... 5.95‡
MartinsFerry,O. W10 .. 5.85*
Middletown,O. A10 .... 5.85‡
Newport,Ky. N9 ..... 5.85‡
Niles,O. N12 ..... 5.85‡
Pittsburg,Calif. C11 ... 6.60*
SparrowsPt.,Md. B2 ... 5.85‡
Steubenville,O. W10 ... 5.85‡
Warren,O. R2 ..... 5.85‡
Weirton,W.Va. W6 .... 5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 .... 6.575

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 .... 8.60
SparrowsPoint(39) B2 .. 8.60

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 6.25
Dravosburg,Pa. U5 .... 6.25
Kokomo,Ind. C16 ..... 6.60
Newport,Ky. N9 ..... 6.25
Niles,O. N12 ..... 7.25

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 ..... 6.10
Canton,O. R2 ..... 6.60
Middletown,O. A10 .... 6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 ..... 6.70
Niles,O.(28) R2 ..... 6.70
Weirton,W.Va. W6 .... 6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.50
Butler,Pa. A10 (type 2) 8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 ..... 5.90
Cleveland R2 ..... 5.90
Dravosburg,Pa. U5 .... 5.90
Gary,Ind. U5 ..... 5.90
GraniteCity,Ill. G4 .... 6.10
Ind.Harbor,Ind. I-2 ... 5.90
Middletown,O. A10 .... 5.90
Niles,O. N12 ..... 5.90
Youngstown Y1 ..... 5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ... 7.75
Yorkville,O. W10 ..... 7.75

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 ..... 6.25
Mansfield,O. E6 ..... 6.25
Middletown,O. A10 .... 6.25
Niles,O. N12 ..... 6.25
Weirton,W.Va. W6 .... 6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ..... 6.65

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division, H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.325
Allenport,Pa. P7 .....4.325
Alton,Ill. L1 .....4.50
Ashland,Ky.(8) A10 ...4.325
Atlanta A11 .....4.525
Bessemer,Ala. T2 .....4.325
Birmingham C15 .....4.325
Bridgeport,Conn. N19 ..4.625
Buffalo(27) R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit M1 .....4.425
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 .....5.075
Gary,Ind. U5 .....4.325
Ind.Harbor,Ind. I-2, Y1.4.325
Johnstown,Pa.(25) B2. .4.325
Lackaw'na,N.Y.(25) B2 4.325
LosAngeles(25) B3 ....5.075
Milton,Pa. M18 .....4.325
Minnequa,Colo. C10 ...5.425
NewBritain(10) S15 ...4.325
N.Tonawanda,N.Y. B11 4.325
Pittsburg,Calif. C11 ...5.075
Portsmouth,O. P12 ....4.325
Riverdale,Ill. A1 .....4.325
SanFrancisco S7 .....5.05
Seattle(25) B3 .....5.325
Seattle N14 .....5.40
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
S.SanFrancisco(25) B3.5.075
SparrowsPoint,Md. B2..4.325
Sterling(1) N15 .....4.325
Sterling,Ill. N15 .....4.425
Torrance,Calif. C11 ...5.075
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5 .....4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19 ...7.50
Carnegie,Pa. S18 .....7.20
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....7.20
Ind.Harbor,Ind. Y1 ....7.20
LosAngeles B3 .....8.40
Newport,Ky. N9 .....7.20
Sharon,Pa. S3 .....7.20
S.Chicago W14 .....7.20
Youngstown U5, Y1 ....7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.425
Conshohocken,Pa. A3 ..6.425
Ecorse,Mich. G5 .....6.525
Fairfield,Ala. T2 .....6.425
Fontana,Calif. K1 .....7.525
Gary,Ind. U5 .....6.425
Houston 85 .....6.675
Ind.Harbor,Ind. I-2, Y1.6.425
KansasCity,Mo. 85 ....6.675
Lackawanna,N.Y. B2 ..6.425
LosAngeles(25) B3 ....7.175
Seattle(25) B3 .....7.425
Sharon,Pa. S3 .....6.425
S.SanFrancisco(25) B3.7.175
SparrowsPoint,Md. B2..6.425
Warren,O. R2 .....6.425
Weirton,W.Va. W6 ....6.425
Youngstown U5, Y1 ...6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.575
Warren,O. R2 .....4.925

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....6.25
Baltimore T6 .....6.25
Boston T6 .....6.80
Buffalo S40 .....6.25
Cleveland J5 .....6.45
Cleveland A7 .....6.25
Conshohocken,Pa. A3 ...6.30
Dearborn,Mich. D3 ....6.35
Detroit D2, M1, P20....6.35
Dover,O. G6 .....6.25
Ecorse,Mich. G5 .....6.35
Follansbee,W.Va. F4 ...6.25
Fontana,Calif. K1 .....8.00
FranklinPark,Ill. T6 ...6.35
Ind.Harbor,Ind. I-2 ....6.35
Ind.Harbor,Ind. Y1 ....6.45
Indianapolis C8 .....6.40
Lackawanna,N.Y. B2 ...6.25
LosAngeles C1 .....8.50
NewBedford,Mass. R10..6.70
NewBritain(10) S15 ....6.25
NewCastle,Pa. B4, E5...6.25
NewHaven,Conn. A7 ....7.00
NewHaven,Conn. D2 ....6.70
NewKensington,Pa. A6 ..6.25
Pawtucket,R.I. R3 .....6.90
Pawtucket,R.I. N8 .....6.80
Pittsburgh J5 .....6.45
Portsmouth,O. P12 .....6.25
Riverdale,Ill. A1 .....6.35
Rome,N.Y.(32) R6 .....6.25
Sharon,Pa. S3 .....6.25
SparrowsPt.,Md. B2 ....6.25
Trenton,N.J.(31) R5 ...7.80
Wallingford,Conn. W2 ..6.70
Warren,O. R2 T5 .....6.25
Weirton, W.Va. W6 ....6.25
Worcester,Mass. A7 ....7.10
Youngstown Y1 .....6.45
Youngstown C8 .....6.25

STRIP, Cold-Rolled Alloy

Boston T6 .....13.80
Carnegie,Pa. S18 .....13.45
Cleveland A7 .....13.45
Dover,O. G6 .....13.45
FranklinPark,Ill. T6 ...13.45
Harrison,N.J. C18 .....13.45
Indianapolis C8 .....13.60
Pawtucket,R.I. N8 ....13.80
Sharon,Pa. S3 .....13.45
Worcester,Mass. A7 ...13.75
Youngstown C8 .....13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7 .....9.10
Dearborn,Mich. D3 ....9.20
Dover,O. G6 .....9.30
Ecorse,Mich. G5 .....9.20

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol,Conn. W1	...	...	10.80	12.95	....
Carnegie,Pa. S18	...	8.95	10.50	12.65	....
Cleveland A7	7.00	8.95	10.50	12.65	15.35
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	7.10	9.05	10.60	...	....
Detroit D2	7.10	9.05	10.60	12.75	....
Dover,O. G6	7.00	8.95	10.50	12.65	15.35
Follansbee,W.Va. F4	7.40	8.95	10.50**	....	....
FranklinPark,Ill. T6	7.10	8.95	10.50	12.65	15.35
Harrison,N.J. C18	...	...	10.80	12.95	15.65
Indianapolis C8	7.15	9.10	10.50	12.65	15.35
NewBritain,Conn.(10) S15	7.00	8.95	10.50	12.65	15.35
NewCastle,Pa. B4, E5	7.00	8.95	10.50	12.65	....
NewHaven,Conn. D2	7.45	9.25	10.80	12.95	....
NewKensington,Pa. A6	7.00	8.95	10.50	....	....
New York W3	...	9.25	10.80	12.95	15.65
Pawtucket,R.I. N8	7.55	9.25	10.80	12.95	15.35
Riverdale,Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome,N.Y.(32) R6	7.00	8.95	10.50	12.65	15.35
Sharon,Pa. S3	7.00	8.95	10.50	12.65	15.35
Trenton,N.J. R5	...	9.25	10.80	12.95	15.65
Wallingford,Conn. W2	7.45	9.25	10.80	12.95	15.65
Warren,O. T5	7.00	8.95	10.50	12.65	15.35
Weirton,W.Va. W6	7.00	8.95	10.50	12.65	15.35
Worcester,Mass. T6	7.55	9.25	10.80	12.95	15.65
Worcester,Mass. A7	7.85	9.25	10.80	12.95	15.65
Youngstown C8	7.00	8.95	10.50	12.65	15.35

**0.065 C. max.

Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Youngstown C8	...	...	14.75	17.95	21.35

Ind.Harbor,Ind. Y1 ....9.30
Lackawanna,N.Y. B2 ..9.125
Sharon,Pa. S3 .....9.10
SparrowsPoint,Md. B2..9.125
Warren,O. R2 .....9.10
Weirton,W.Va. W6 .....9.10
Youngstown Y1 .....9.30

STRIP, Electrogalvanized

Cleveland A7 .....6.25*
Dover,O. G6 .....6.25*
Riverdale,Ill. A1 .....6.55*
Youngstown C8 .....6.25*
Warren,O. T5 .....6.25*
Warren,O. B9 .....6.45*
Weirton,W.Va. W6 .....5.75*
Worcester,Mass. A7 ...7.10*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....6.55

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.05
Riverdale,Ill. A1 .....4.90
Sharon,Pa. S3 .....4.75
Youngstown U5 .....4.75

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10 ..	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. N12	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2 ..	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	....	....	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60
Zanesville,O. A10	....	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	13.55‡
Butler,Pa. A10	....	....	17.45	17.95	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	13.55
Warren,O. R2	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ‡Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.675	6.875	7.075

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5 ....6.65
Gary,Ind. U5 .....6.65
GraniteCity,Ill. G4 .....6.75
Ind.Harbor,Ind. Y1 ....6.65
Yorkville,O. W10 .....6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5 ....$7.85
Gary,Ind. U5 .....7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 .....$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 .....9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...6.25
Aliquippa,Pa. J5 .....6.25
Alton,Ill. L1 .....6.425
Atlanta A11 .....6.45
Bartonville,Ill. K4 .....6.35
Buffalo W12 .....6.25
Chicago W13 .....6.25
Cleveland A7 .....6.25
Crawfordsville,Ind. M8..6.35
Donora,Pa. A7 .....6.25
Duluth,Minn. A7 .....6.25
Fairfield,Ala. T2 .....6.25
Fostoria,O.(24) S1 .....6.45
Houston 85 .....6.50
Jacksonville,Fla. M8 ...6.77
Johnstown,Pa. B2 .....6.25
Joliet,Ill. A7 .....6.25
KansasCity,Mo. 85 .....6.50
Kokomo,Ind. C16 .....6.35
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.50
Monessen,Pa. P7 .....6.25
Newark 6-8 ga. I-1 ....6.90
N.Tonawanda B11 .....6.25
Palmer,Mass. W12 .....6.55
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 .....6.25
Rankin,Pa. A7 .....6.25
S.Chicago,Ill. R2 .....6.25
S.SanFrancisco C10 ....7.20
SparrowsPoint,Md. B2 ..6.35
Sterling,Ill.(1) N15 ....6.25
Sterling,Ill. N15 .....6.35
Struthers,O. Y1 .....6.25
Waukegan,Ill. A7 .....6.25
Worcester,Mass. A7 ....6.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.90
Alton,Ill. L1 .....8.075
Bartonville,Ill. K4 .....8.00
Buffalo W12 .....7.90
Cleveland A7 .....7.90
Donora,Pa. A7 .....7.90
Duluth,Minn. A7 .....7.90
Fostoria,O. S1 .....7.95
Johnstown,Pa. B2 .....7.90
LosAngeles B3 .....8.85
Milbury,Mass.(12) N6 ..8.20
Minnequa,Colo. C10 ....8.15
Monessen,Pa. P16 .....7.90
Muncie,Ind. I-7 .....8.10
Palmer,Mass. W12 .....8.20
Pittsburg,Calif. C11 ...8.85
Portsmouth,O. P12 .....7.90
Roebling,N.J. R5 .....8.20
S.Chicago,Ill. R2 .....7.90
S.SanFrancisco C10 ....8.85
SparrowsPt.,Md. B2 ...8.00
Struthers,O. Y1 .....7.90
Trenton,N.J. A7 .....8.20
Waukegan Ill. A7 .....7.90
WorcesterA7,J4,T6,W12, 8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....7.60
Alton,Ill. L1 .....7.775
Buffalo W12 .....7.60
Cleveland A7 .....7.60
Donora,Pa. A7 .....7.60
Duluth,Minn. A7 .....7.60
Johnstown,Pa. B2 .....7.60
KansasCity,Mo. 85 .....7.85
LosAngeles B3 .....8.55
Minnequa,Colo. C10 ....7.775
Monessen,Pa. P16 .....7.60
NewHaven,Conn. A7 ....7.90
Palmer,Mass. W12 .....7.90
Pittsburg,Calif. C11 ....8.55
Portsmouth,O. P12 .....7.60
Roebling,N.J. R5 .....7.90
S.Chicago,Ill. R2 .....7.60
S.SanFrancisco C10 ....8.55
SparrowsPoint,Md. B2 ..7.70
Struthers,O. Y1 .....7.60
Trenton,N.J. A7 .....7.90
Waukegan,Ill. A7 .....7.60
Worcester,Mass. A7 ....7.90

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....12.725
Bartonville,Ill. K4 ....12.65
Buffalo W12 .....12.55
Chicago W13 .....12.55
Cleveland A7 .....12.55
Crawfordsville,Ind. M8.12.65
Fostoria,O. S1 .....12.55
Jacksonville,Fla. M8 ...13.05
Johnstown,Pa. B2 .....12.55
Kokomo,Ind. C16 .....12.55
Minnequa,Colo. C10 ....12.30
Monessen,Pa. P16 .....12.55
Muncie,Ind. I-7 .....12.75
Palmer,Mass. W12 .....12.85
Roebling,N.J. R5 .....12.85
S.SanFrancisco C10 ....12.90
Waukegan,Ill. A7 .....12.55
Worcester,Mass. T6 ....12.85
Worcester,Mass. A7....12.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....10.70
Buffalo W12 .....10.70
Johnstown,Pa. B2 .....10.70
Minnequa,Colo. C10 ...10.825
Monessen,Pa. P16 .....10.70
Muncie,Ind. I-7 .....10.90
Pittsburg,Calif. C11 ...11.50
Portsmouth,O. P12 .....10.70
Roebling,N.J. R5 .....11.00
SparrowsPt.,Md. B2 ...10.80

ROPE WIRE (A)

Bartonville,Ill. K4 .....10.55
Buffalo W12 .....9.75
Fostoria,O.(23) S1 .....10.55
Johnstown,Pa. B2 .....10.55
Monessen,Pa. P16 .....10.55
Muncie,Ind. I-7 .....10.75
Palmer,Mass. W12 .....10.05
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.85
SparrowsPt. B2 .....10.65
Struthers,O. Y1 .....10.55
Worcester,Mass. J4 ....10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	9.00
Baltimore T6	9.30
Buffalo W12	9.00
Cleveland A7	9.00
Crawfordsville,Ind. M8	9.00
Dover,O. G6	9.00
Fostoria,O. 81	9.00
FranklinPark,Ill. T6	9.10
Kokomo,Ind. C16	9.00
Massillon,O. R8	9.00
Milwaukee C23	9.20
Monessen,Pa. P16	9.00
Pawtucket,R.I. N8	9.30
Riverdale,Ill. A1	9.10
Rome,N.Y. R6	9.00
Trenton,N.J. R5	9.30
Worcester A7, T6, W12	9.30

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston Tex. D7	157
Houston,Tex. S5	157
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen Pa. P7	152
Pittsburg Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.05
Wheeling,W.Va. W10	9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.35
Bartonville,Ill. K4	9.45
Buffalo W12	9.35
Crawfordsville,Ind. M8	9.46
Donora,Pa. A7	9.35
Duluth,Minn. A7	9.35
Johnstown,Pa. B2	9.35
Joliet,Ill. A7	9.35
Kokomo,Ind. C16	9.45
LosAngeles B3	10.14
Minnequa,Colo. C10	9.60
Pittsburg,Calif. C11	10.43
S.Chicago,Ill. R2	9.35
SparrowsPt.,Md. B2	9.45
Sterling,Ill. N15	9.35

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.65
Bartonville,Ill. K4	9.75
Buffalo W12	9.60
Crawfordsville,Ind. M8	9.75
Donora,Pa. A7	9.65
Duluth,Minn. A7	9.65
Johnstown,Pa. B3	9.65
Joliet,Ill. A7	9.65
Kokomo,Ind. C16	9.75
LosAngeles B3	10.45
Minnequa,Colo. C10	9.90
Pittsburg,Calif. C11	10.13
S.Chicago,Ill. R2	9.65
SparrowsPt.,Md. B2	9.75
Sterling,Ill. N15	9.65

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.70
Bartonville,Ill. K4	9.80
Buffalo W12	9.70
Crawfordsville,Ind. M8	9.80
Donora,Pa. A7	9.70
Duluth,Minn. A7	9.70
Johnstown,Pa. B2	9.70
Joliet,Ill. A7	9.70
Kokomo,Ind. C16	9.80
LosAngeles B3	11.05
Minnequa,Colo. C10	9.95
Pittsburg,Calif. C11	10.50
S.Chicago,Ill. R2	9.70
SparrowsPt.,Md. B2	9.80
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.175**
Aliquippa J5	172§
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180†
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180†
Kokomo,Ind. C16	177†
Minnequa,Colo. C10	180**
Monessen Pa. P7	179*
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179*

WOVEN Fence, 9-15 Ga.

	Col.
Ala.City,Ala. R2	162**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga. J5	165§
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167†
Johnstown,Pa.(43) B2	166
Joliet Ill. A7	162†
KansasCity Mo. S5	167†
Kokomo,Ind. C16	164†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P17	166*
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166*

WIRE (16 Gage)	An'ld Galv. Stone	Galv. Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14.60	16.50
Buffalo W12	14.50	
Cleveland A7	14.50	
Crawf'dsville M8	14.60	16.50
Fostoria,O. 81	14.60	16.15†
Johnstown B2	14.15	16.40*
Kokomo C16	14.60	16.15†
Minnequa C10	14.75	16.45**
Palmer MassW12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.40
Waukegan A7	14.50	16.05†
Worcester A7	14.80	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	7.40 7.80**
Aliquippa J5	7.40 7.925§
Atlanta A11	7.50 8.075
Bartonville(48) K4	7.50 8.075
Buffalo W12	7.40 8.80†
Cleveland A7	7.40
Crawfordsville M8	7.50 8.075
Donora,Pa. A7	7.40 7.80†
Duluth,Minn. A7	7.40 7.80†
Fairfield T2	7.40 7.80†
Houston,Tex. S5	7.65 8.05†
Jacks'ville,Fla.M8	7.90 8.475
Johnstown B2(48)	7.40 7.975*
Joliet Ill. A7	7.40 7.80†
KansasCity Mo. S5	7.65 8.05†
Kokomo C16	7.50 7.90†
LosAngeles B3	8.35 8.925*
Minnequa C10	7.65 8.05**
Monessen P7 (48)	7.40 7.975*
Palmer,Mass. W12	7.70 8.10†
Pitts.,Calif. C11	8.35 8.75†
Portsmouth,O. P12	7.40
Rankin A7	7.40 7.80†
S.Chicago R2	7.40 7.80**
S.SanFran. C10	8.35 8.75**
Spar'wsPt.B2(48)	7.50 8.075*
Str'ling(1)(48)	N15 7.40 7.975*
Struthers,O.(48)	Y1 7.40 7.90‡
Worcester,Mass.	A7 7.70

*Based on 12.50c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	.157†
Duluth,Minn. A7	.157
Franklin,Pa. F5	.157†
Huntington,W.Va. W7	.157
Johnstown,Pa. B2	.160
Marion O. P11	.157
Minnequa,Colo. C10	.162
Moline Ill R2	.167
S.Chicago,Ill. R2	.157
Tonawanda,N.Y. B12	.157
Williamsport,Pa. S10	.160

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, less case lots, per cent off list, f.o.b. midwestern plants)

4" and shorter:	
½" & smaller diam.	+5
Over 4" through 6":	
½" and smaller diam.	+12
6" and shorter:	
⅝" and ⅝"	+13
¾" and larger	+16
Longer than 6":	
All diameters	+25
Lag bolts, all diams:	
6" and shorter	+2
Over 6" long	+11
Ribbed Necked Carriage	+13
Blank	2
Plow	18
Step, Elevator, Tap and Sleigh Shoe	2
Tire Bolts	12
Boiler & Fitting-Up Bolts	14

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	51
H.P., Hex. regular & heavy	
⅜" and smaller	55
⅞" to 1⅛", inclusive	55
1¼" to 1½", inclusive	57
1⅝" and larger	51
C.P. Hex regular & heavy:	
⅜" and smaller	55
Larger than ¾"	51
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	36
Finished Hex Nuts:	
⅜" and smaller	55
⅞" and larger	51
Semifinished & Slotted Hex:	
Regular and heavy, ⅜" and smaller	55
⅞" and larger	51

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages; plain finish)

3" and shorter:	
⅛" thru ¼" diam, 25,000 to 200,000 pieces	61
Over 200,000 pieces	64
5/16" thru ½" diam: 15,000 to 100,000 pieces	61
100,000 or more	64
Longer than 3", any diam: 5000 to 100,000 pieces	61
Over 100,000 pieces	64

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)	
1" diam x 6" and shorter	19
1" and smaller diam x over 6"	List

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)	
6" or shorter:	
¼" through ½"	34
9/16" & ⅝" & shorter	31
¾", ⅞" through 1 in.	8

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.06	20.41
1¼	13	....	24.94	20.44
1½	13	23.31	27.57	22.60
1¾	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2½	12	37.73	44.63	36.59
2½	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.54

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	...	5.65
Fairfield,Ala. T2	...	...	...	5.65
Gary,Ind. U5	4.725	...	...	...
Huntington,W.Va. W7	...	...	...	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	...
Johnstown,Pa. B2	...	...	...	(16)5.65
Lackawanna,N.Y. B2	4.725	4.625	...	5.65
Minnequa,Colo. C10	4.725	4.625	...	6.15
Steelton,Pa. B2	4.725	4.625	...	...
Williamsport,Pa. S19	...	...	...	5.65

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torrance,Calif. C11	5.775

TRACK BOLTS (20) Treated

Cleveland R2	12.40
KansasCity,Mo. S5	12.40
Lebanon,Pa. B2	12.40
Minnequa,Colo. C10	12.40
Pittsburgh O3, P14	12.40
Seattle B3	12.90

AXLES

Ind.Harbor,Ind. S13	7.25
Johnstown,Pa. B2	7.25

JOINT BARS

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.90
Ind.Harbor,Ind. I-2, Y1	7.90
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	7.90
Minnequa,Colo. C10	7.90
Pittsburgh J5	7.90
Seattle B3	8.40
S.Chicago,Ill. R2	7.90
Struthers,O. Y1	7.90
Youngstown R2	7.90

METAL POWDERS

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum: Atomized, 500 lb drums, frght. allowed	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	39.00-49.00†
Bronze, 5000-lb lots	58.00-61.50†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	53.25-60.00†
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	18.25-32.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.50
Less than 1000 lb	4.65
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld San Francisco Bay area.
(23) Mild plow, 10.55c.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.15c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.30c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Ambridge, Pa. N2	6.5	...	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	...
Lorain, O. N3	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Youngstown Y1	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Youngstown R2	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

BUTTWELD STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Alton, Ill. L1	...	...	....	....	....	....	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Benwood, W. Va. W10	16.5	+12	7.25	+18.25	+1.75	+26.25	17.5	0.25	20.5	4.75	23	7.75	25.5	7
Butler, Pa. F6	17.5	+11	9	+16.5	0.5	+24	....	....	....	....	....	....	....	....
Etna, Pa. N2	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Fairless Hills, Pa. N3	...	...	....	....	....	....	15.5	+1.75	18.5	2.75	21	5.75	23.5	7
Fontana, Calif. K1	...	...	....	....	....	....	6	+11.25	9	+7.25	11.5	+3.75	14	+2.5
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Lorain, O. N3	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sharon, Pa. S4	17.5	+11	9	+16.5	0.5	+24	....	....	....	....	....	....	....	....
Sharon, Pa. M6	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
Aliquippa, Pa. J5	26	10	26.5	10.5	28	10.75	28	10.75	....	....	....	....
Alton, Ill. L1	24	8	24.5	8.5	26	8.75	26	8.75	....	....	....	....
Benwood, W. Va. W10	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Etna, Pa. N2	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Fairless Hills, Pa. N3	24	8	24.5	8.5	26	8.75	26	8.75	16.5	+1.25	16.5	+1.25
Fontana, Calif. K1	14.5	+1.5	15	+1	16.5	+0.75	16.5	+0.75	7	+10.75	7	+10.75
Ind. Harbor, Ind. Y1	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Lorain, O. N3	26	10	26.5	10.5	28	10.75	28	10.75	....	....	....	....
Sharon, Pa. M6	26	10	26.5	10.5	28	10.75	28	10.75	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.[illegible]	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
201	17.00	21.50	....	....	31.00	....	....	42.25	39.00
202	18.25	24.00	31.00	36.25	33.50	36.75	38.75	42.50	42.50
301	17.75	22.25	....	36.75	32.00	38.00	....	44.25	41.00
302	19.00	24.75	32.00	37.25	34.50	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	41.00	....	....	....
304	20.25	26.00	33.75	39.00	37.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	45.25	48.00	52.25	52.25
305	21.75	28.25	....	39.50	40.25	40.25	43.50	50.25	50.25
308	22.00	29.00	38.50	44.25	41.25	45.50	49.75	52.00	52.00
309	29.50	38.25	46.75	53.50	53.50	54.75	58.25	67.00	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00	74.00
310	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75	78.75
314	....	....	....	....	....	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.75	63.25	65.75	69.25	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25	54.25
18-SCbTa	29.25	38.00	45.75	52.25	53.25	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	34.00	36.25	....	44.00
405	17.50	23.00	26.75	31.00	32.25	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	31.00	....	....	....
420	23.50	30.25	31.00	36.00	37.75	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	31.50	....	....	....
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00
446	....	....	35.50	40.50	53.25	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co., American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets Carbon Base 20%
Stainless:			
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled: 10%	Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular carbon	0.275	5%Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.090
18.25	4.25	1	4.75	....	2.305-2.475
18	4	2	9	....	2.675-2.6775
18	4	2	....	....	1.765
18	4	1	....	....	1.600
13.75	3.75	2	5	....	2.245
13.5	4	3	....	....	1.865
9	3.5	....	....	....	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City, Ala. R2	54.50	55.00‡	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00†	....
Woodward, Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda, N.Y. W12	58.50	59.00	59.50	60.00
N. Tonawanda, N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester, N.Y. deld.	61.52	62.02	62.52	....
Syracuse, N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary, Ind. U5	58.50	....	59.00	....
S. Chicago R2	58.50	....	59.00	....
S. Chicago, Ill. Y1	58.50	59.00	59.00	59.50
S. Chicago, Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.67
Muskegon, Mich., deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron, O., deld.	61.25	61.75	61.75	62.25
Lorain, O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem, Pa. B2	60.50	61.00	61.50	62.00
New York, deld.	....	64.78	65.28	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro, Pa. B10	60.50	61.00	61.50	62.00
Chester, Pa. C31	54.50	55.00	55.50	....
Philadelphia, deld.	56.16	56.66	57.16	....
Steelton, Pa. B2	60.50	61.00	61.50	62.00
Swedeland, Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy, N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
Neville Island, Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	60.37	60.37	60.87
McKees Rocks, deld.	....	60.04	60.04	60.54
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	....	60.66	60.66	61.16
Verona, Trafford, deld	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer, Pa. U5	58.50	....	59.00	59.50
Clairton, Rankin, S. Duquesne, Pa. U5	58.50	....	....	....
McKeesport, Pa. N3	58.50	....	....	59.50
Midland, Pa. C18	58.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard, O. Y1	....	....	59.00	....
Sharpsville, Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield, O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie, Pa. I-3	58.50	59.00	59.00	59.50
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	64.50	65.00	....	....
Geneva, Utah C11	58.50	59.00	....	....
Granite City, Ill. G4	60.40	60.90	61.40	....
Ironton, Utah C11	58.50	59.00	....	....
Lone Star, Texas L6	52.00	55.00*	52.50	....
Minnequa, Colo. C10	60.50	61.00	61.50	....
Rockwood, Tenn. T3	....	55.00‡	59.00	....
Toledo, O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75; $56, Phos. 0.31-0.50.
†Phos., 0.30 max.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson, O. G2, J1	$67.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$80.50
Keokuk, Iowa, (Open-hearth & Fdry, freight allowed K2)	87.50
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	90.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035 max.)	$72.50
Steelton, Pa. B2 (Phos. 0.035 max.)	66.50
Philadelphia, deld.	70.05
Troy, N.Y. R2 (Phos. 0.035 max.)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075 max.)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075 max.)	63.50
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075 max.)	63.50

Warehouse Steel Products

Representative prices, cents per pound subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, Cleveland, Erie, 30 cents; Chicago, Milwaukee, St. Louis, St. Paul, Detroit, Cincinnati, Pittsburgh, 25 cents; Philadelphia, New York, Baltimore, Boston, San Francisco, Los Angeles, and Portland, Oreg., 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	....	7.42	9.39	....	7.63	7.49	9.48
Baltimore	7.03	8.32	9.10	....	7.65	....	7.61	8.62[2]	13.44	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85	....	7.06	....	7.08	9.35	....	7.28	6.99	9.10
Boston	7.70	8.81	10.27	45.67	7.96	....	7.83	9.53	14.45	8.13	7.89	9.36
Buffalo	6.80	8.05	9.77	....	7.15	....	7.10	7.90	13.10	7.40	7.15	8.70
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	....	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.80	7.93	8.50	46.55	7.06	....	7.08	7.75	12.85	7.28	6.99	8.46
Cincinnati	6.92	7.92	8.90	46.10	7.30	....	7.32	8.05	13.09	7.75	7.28	8.71
Cleveland	6.80	7.93	8.85	....	7.16	....	7.14	7.85	12.91	7.61	7.16	8.63
Detroit	6.99	8.12	8.78	43.50	7.34	....	7.36	8.04	13.05	7.75	7.27	8.65
Erie, Pa.	6.80	7.90	8.85	....	7.15	....	7.08	7.85	....	7.40	7.15	8.63
Houston	7.85	8.75	10.49	....	8.15	....	8.25	9.85	14.00	8.20	7.80	9.20
Los Angeles	8.05	10.00	11.00	....	8.35	....	8.05	11.25	14.25	8.30	8.05	10.25
Milwaukee	6.89	8.02	8.59	....	7.15	....	7.17	7.94	12.94	7.45	7.08	8.55
Moline, Ill.	7.15	8.28	8.85	....	7.41	....	7.43	8.10	....	7.63	7.34	....
New York	7.46	8.68	9.44	44.95	8.07	....	7.96	9.48	13.28	7.99	7.76	9.19
Norfolk, Va.	7.25	....	....	....	7.65	....	7.65	9.50	....	7.95	7.45	8.95
Philadelphia	7.14	8.42	9.35	45.98	7.67	9.02	7.64	8.46	13.16	7.74	7.37	8.69**
Pittsburgh	6.80	7.93	9.20	48.67	7.16	....	7.08	7.85	12.85	7.28	6.99	8.46
Portland, Oreg.	7.80	8.80	10.65	....	8.00	....	7.95	11.80	15.00	7.85	7.75	9.60
Richmond, Va.	7.00	....	9.47	....	7.65	....	7.70	8.85	....	7.95	7.20	9.18
St. Louis	7.09	8.22	9.19	43.89	7.35	....	7.37	8.14	13.14	7.68	7.28	8.75
St. Paul	7.46	8.59	9.16	....	7.72	....	7.74	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	....	8.05	11.20	14.25[3]	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65	....	8.35	11.70	14.60	8.30	8.20	10.10
Spokane	8.55	11.00[2]	10.80	....	9.05	....	8.35	11.80	15.35	8.30	8.20	10.60
Washington	7.50	8.79	7.97	....	8.12	....	8.08	9.09	....	8.40	7.68	9.34

Prices do not include gage extras; †prices include gage and coating extras (based on 12.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [2]—500 to 9999 lb; [3]—100 to 999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

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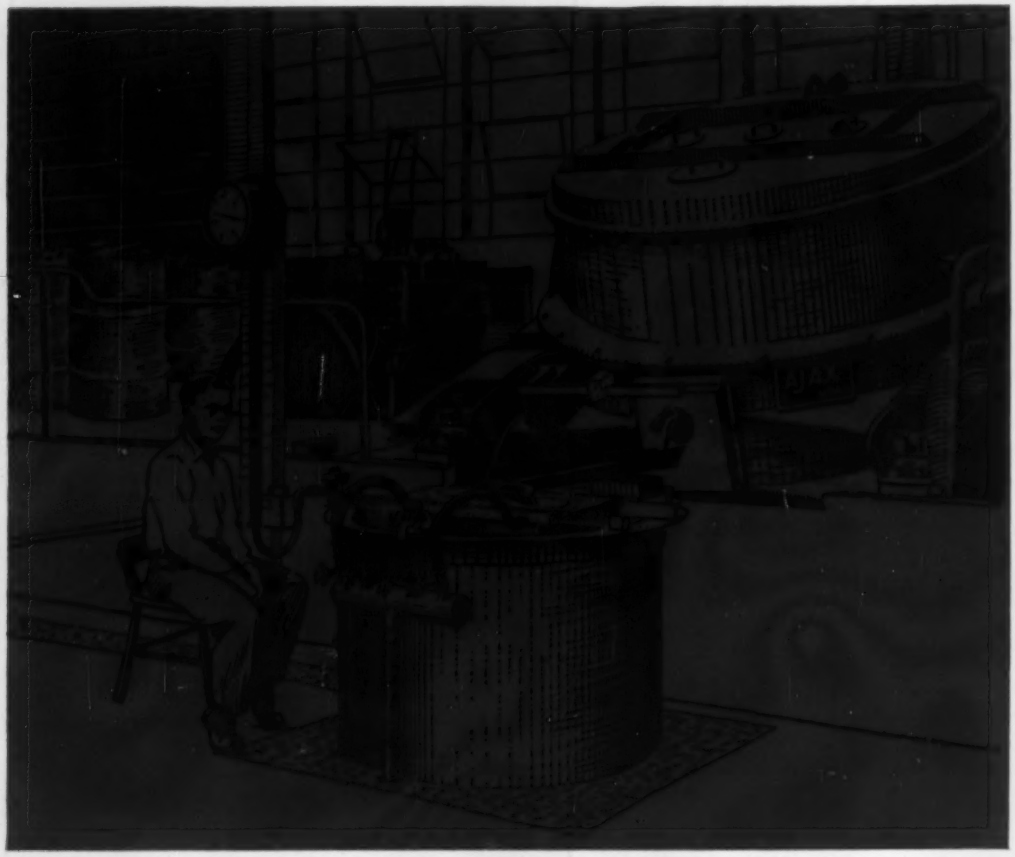

INSTALLATION AT VALLEY METAL PRODUCTS COMPANY - PLAINWELL, MICH.
(SUBSIDIARY OF MUELLER BRASS CO.)

Manufacturers of "Vampco" architectural life long aluminum alloy extrusions, Valley Metal Products Co., use Ajax furnaces exclusively in their billet casting shop, because these furnaces enable them to produce aluminum alloy billets from selected scrap in the high quality required for their product.

The compact layout of this casting shop, shown in the picture, includes two 166 kw Ajax melting furnaces and one Ajax 10,000 lbs. holding furnace which pours into a semi-continuous casting machine. Operation is continuous. **Production is 750,000 lbs. per month.** Metal losses are below 1%. The holding furnace requires no fluxing or chlorinating. Maintenance is low. Working conditions are comfortable and permit full utilization of all productive efforts.

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INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

Workers shoot in lead as ingot is poured at Inland Steel Co.

Heavy Demand for Leaded Steels

BETWEEN 1942 and 1952, Inland Steel Co. made $46 in royalties on its process for adding lead to steel. This year, some 25,000 tons of leaded steel are being made each month by Inland's licensees.

Biggest producers include U. S. Steel Corp., Republic Steel Corp., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co. and Copperweld Steel Co. There are 22 licensees in the United States and one in Canada. Says Robert S. Clingan, general sales manager of Copperweld: "More of the licensees will probably get into production because of increasing demand."

Boom—Copperweld started production in the fall of 1953 and has increased its output every month since. Proportion of leaded steel to total output is now running about one-third at Copperweld. By the end of this year, says Mr. Clingan, "We hope to have production up to 50 per cent of our total melt."

U. S. production has increased tenfold in the last five years. Reason: Addition of lead to steel improves machinability while retaining properties of the parent alloy. At present, some 95 per cent of output is going into cold drawn bar stock. Automatic screw machines use most of it, though forgings are considered a big growth potential and some leaded plate is beginning to sell.

Costs—Joseph T. Ryerson & Son Inc. will add leaded plates to stock late this month. Ryerson has carried leaded steels for about three years, and estimates that it could sell about twice as much if supplies were available. This is in spite of a substantial price differential—at mill level, leaded carbon steels cost about $10 per ton more than conventional carbon steels, leaded alloys cost about $15 more per ton. The warehouse price premium for leaded steels runs about 1 cent per pound.

Adaptation of equipment is one factor slowing production. Open-hearth pouring stands have to be revamped and fume disposal systems must be installed to safeguard workers. Both Illinois and New York states have health laws prohibiting the manufacture of leaded steels. Industrymen say, however, that with proper care there is no real health hazard.

Expansion—Youngstown Sheet & Tube Co., one of two producers making leaded bessemer steel, reports that it will equip a 200-ton open hearth furnace at its East Chicago, Ind., works for leaded steel production. The move is planned for the first part of next year, at an estimated cost of about $500,000. Bessemer leaded is said to have superior surface machining characteristics, though it's not as good as the open-hearth product for interior machining.

Because mills allocate steel on past buying history, plants considering adoption of leaded steel today probably would have to get part of their needs from warehouses, for mills might not be able to fill orders. For at least one of the major producers, deliveries on leaded steel are extended two months further than those on regular items. It could mean waiting six months or more.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 147 & 148

Some sheet sellers are a little better positioned than others in handling their arrearages. There are few if any, who are able to do much more than maintain the status quo, with commitments well in excess of shipments.

Some makers of heavy tonnage items, notably hot and cold-rolled sheets, fear they will have a greater carryover at yearend than at the end of the current quarter. Others think they may get through the closing quarter without increasing arrearages, but few think they will be able to cut them down.

Mills that opened books for the entire fourth quarter were swamped with tonnage immediately.

The tight supply situation applies not only to hot and cold-rolled sheets and galvanized, but also to electrical sheets and enameling stock. One mill is actually booked into May on stainless flat products. Apart from stainless, this producer is accepting no tonnage for rolling beyond end of the year and may withdraw from the market soon on stainless.

Users of lighter gage carbon sheets in New England hope for some easing in supply before yearend. Their reasoning centers on tin plate. Canmakers have heavy inventories and will take out all the tonnage reserved for them before tin plate prices go up Oct. 1. Shipments, it is thought, may fall off after that date leaving sheet tonnage available for other consumers.

No sign of order cancellations is seen in any direction. As a result, the market is very strong pricewise. The latest increase in zinc to 13 cents a lb will not be reflected in galvanized sheet prices since the new quotation does not extend into a higher band in the sheetmakers' coating schedule.

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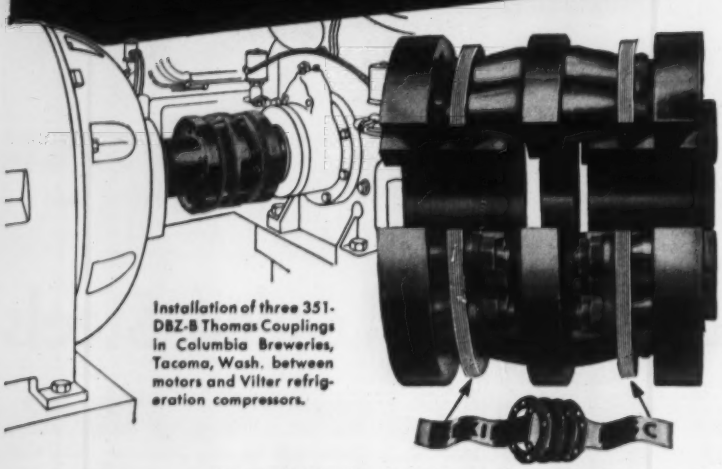

Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

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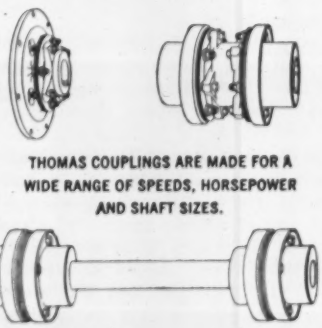
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention, Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



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Tool Steel . . .

Tool Steel Prices, Page 150

Shipments of high speed and tool steel (excluding hollow drill steel) were the smallest in July since December, 1954. Total movement was 7504 tons in the month, reports the American Iron & Steel Institute. This compared with 11,854 in the preceding month and with shipments of 5277 tons in July a year ago.

Total shipments in the first seven months this year were 64,645 net tons. This was substantially up from the 50,190 tons moved in the like period of 1954.

Plates . .

Plate Prices, Page 146

The plate mills are not too badly off as regards their commitments, but most of them are over-sold. They are booked full for the rest of this year for the most part, and those that are not fully committed, could be if they so desired.

Swelling requirements for railroad equipment have placed a heavy burden on the mills. They are providing car builders with at least some tonnage for fourth-quarter delivery, but they can do nothing on the great bulk of such demands until next year.

Shipyards also are showing livelier interest in steel. While demands have not been as pressing as those from the railroads, they are beginning to be felt.

Generally, the mills are out of the market for fourth-quarter business, although one leading eastern producer has not yet officially opened books for November.

Plate shops in New England are pressing for overdue shipments. Timely deliveries of delinquent tonnage usually maintains fabricating operations, notably that of tank shops. More buyers are willing to

pay premium and warehouse prices, or freight from Pittsburgh.

Midwest fabricators are sizing up prospects for getting plates for oil storage tanks to replace the 60 destroyed in the explosion and fire at Whiting, Ind. It is estimated 10,000 tons will be needed.

Lone Star Steel Co., Dallas, Tex., announced a price of $4.85 per 100 lb on carbon steel plates, effective Aug. 26. It had been quoting $4.55, f.o.b. mill.

Tubular Goods . . .

Tubular Goods Prices, Page 150

Early November delivery can be had on some welded pipe sizes on orders placed now. That's the exception in the tubular products market, however. Such items as oil country tubing are booked solidly through the fourth quarter. The mills expect no reduction in production schedules during the rest of this year, although the usual seasonal trend is towards a decline in Canadian and Rocky mountain area consumption during the winter.

The crucial period for oil country goods sales will be first quarter, 1956, when seasonal factors may cause shipments to drop. Except for that possibility, however, the outlook is for continued strong demand for tubing and pipe.

Cast iron pipe sales agencies in the Pacific Northwest are having a breathing spell following an extremely active period starting early this year.

Steel Bars . . .

Bar Prices, Page 146

Fourth quarter will probably be the tightest experienced this year with respect to bar supply. Pittsburgh mills are limiting incoming orders to tonnage they can handle. Supply of hot-rolled bars for cold-finishers has been somewhat disorganized this quarter. Fabricators are accusing producers of over-booking, claiming they are still receiving hot-rolled bars which they had ordered for July delivery.

Pressure for hot bars appears to be as strong as ever and to all intents producers are booked full for the rest of the year. The tight supply situation is general, regardless of size or shape of the bars required, reflecting the highly diversified character of demand. It appears producers have little capacity open for fourth quarter, except in alloys, and some cold-finished in New England. Stainless bars are available in the area for mid-fourth-quarter delivery.

Indications are the bar mills are becoming more cautious in booking orders as fourth quarter nears.

Warehouse . . .

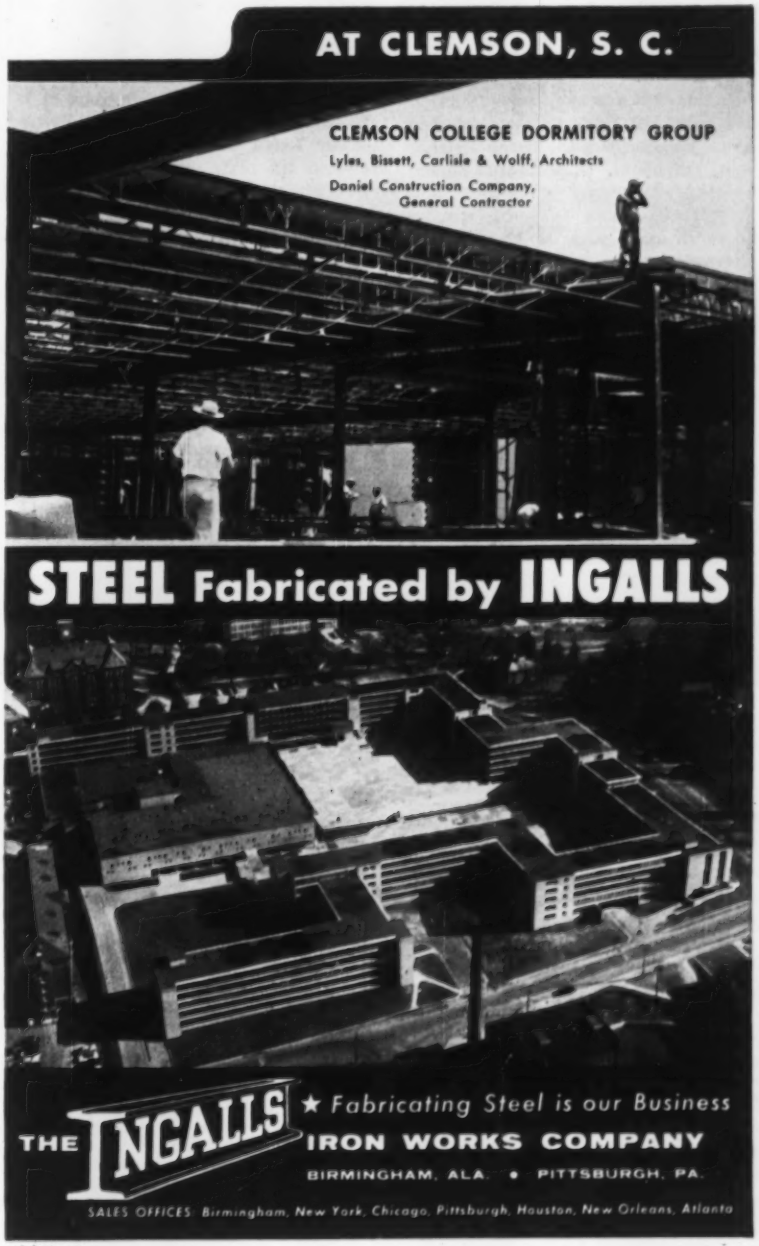
Warehouse Prices, Page 151

Warehouses anticipate a gain in business this month despite difficulty in obtaining steel from the mills. The latter are behind shipping schedules on most carbon products, indicating warehouse stocks will be more critical before they improve at the current rate of demand. Inquiry for alloys and specialties is mounting, but stocks are sufficient to meet the increased volume.

Inventories are unbalanced, especially in structurals and plate and, to some extent, in 3-in. and larger carbon bars, angles and galvanized sheets.

Warehouses in the flood-stricken area have been virtually cleaned out of supplies of nails and certain types of merchant wire. Demand for steel in the entire northeastern section of the country is brisk.

Several small distributors in the Pittsburgh area can't get enough flat-rolled steel and construction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products to service their customers as well as they did early this year.

Wire . . .

Wire Prices, Pages 148 & 149

Incoming orders for high carbon wire specialties, finer sizes excepted, are heavier than shipments at some points, and, as a result, wire mill backlogs are mounting. More consumers of manufacturers bright wire are covered well through fourth quarter; also cold heading and spring grade users.

Orders for wire items going into automobile assemblies are unabated, suppliers building up banks of accessories for 1956 models. Shipments needed for highway repairs and new construction are heavy, including wire for reinforced concrete pipe. Springmakers are back in production where flood damage in the East was recently experienced. Three Bristol, Conn., divisions, Associated Spring Corp., are utilizing all coiling capacity and delays in filling spring orders, in most cases, will not exceed one week.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 148

Reinforcing steel bar prices are firmer in New England, and supply is narrowing. Most sellers are heavily booked up in the area and confront a reduction in mill tonnage. Stocks of ½-in. and ⅝-in. material are smaller in new billet grades. Practically all reinforcing bar tonnage for the Massachusetts turnpike has been purchased. The bulk of it went at prices upward of $20 per ton under the current market.

Structural Shapes . . .

Structural Shape Prices, Page 148

Structural fabricators are worried about their ability to obtain plain material—plates as well as shapes. The mills are behind on shipment promises, and some fabricating shops say they may have to curtail operations unless they get supply relief.

There is ample business around at more profitable prices than have prevailed throughout most of the year. So there is little concern on that score.

New England fabricators are hard pressed for steel supplies. Reduced mill bookings for fourth quarter, with carryovers up to 10 weeks on wide flange beams, find fabricating shops low on steel and not covered on all of their contract requirements.

At best, structural steel orders placed with mills in October cannot be shipped before January-February. Emergency tonnage for bridge repairs is not displacing much volume.

Prices on fabricated material are firmer in New England.

Approach of yearend and weather which is not propitious for construction, is no deterrent on structural demand in the Midwest.

Inland Steel Co. expected to begin production of wide flange beams late this month.

Tin Plate . . .

Tin Plate Prices, Page 148

Shipments of tin plate continue to increase, as users recognize that they will have to pay higher prices after Oct. 1. Despite the rise in demand the outlook is for continued strong shipments and incoming orders after the price increase becomes effective.

Consumers may receive some benefit in fourth quarter in the form of lower extra costs on differentially-coated tin plate. Producers say improvements in production techniques make it possible to cut their costs.

Iron Ore . . .

Iron Ore Prices, Page 161

Shipments of Lake Superior iron ore in the week ended Sept. 5 were 3,077,295 gross tons, reports the Lake Superior Iron Ore Association. This brought the season's movement to 54,431,242 tons. In the like week a year ago shipments amounted to 2,070,100 tons, and the season's movement to Sept. 5, 1954, was only 43,890,996 tons.

Pig Iron . . .

Pig Iron Prices, Page 151

Pig iron demand is a shade livelier, although in no way pressing. Sellers experienced a slight upturn in business in August and anticipate additional gains this month. They doubt that trading will reach the June level before October.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 161

Production of coke in June showed a slight decrease from May output, reports the Bureau of Mines. Output totaled 6,155,087 net tons, off 4.2 per cent from the 6,426,747 tons produced in May but up sharply from the 4,652,500 tons turned out in June, 1954.

Stocks of oven coke at producers' plants declined 154,717 tons to 2,191,324 tons, equivalent to 11 days' production at the June rate.

Semifinished Steel . . .

Semifinished Prices, Page 146

Lone Star Steel Co., Dallas, Tex., announced a price of $74.50 per net ton on rerolling billets, blooms and slabs, effective Aug. 26. It had been quoting $70. It also effected a price of $4.625 per 100 lb on skelp. Its former price was $4.30.

Imported Steel More Active

Some loosening up in steel imports from Europe is noted, principally in the South and Southwest. This is particularly true in merchant wire products, special shapes and furring channels; also in reinforcing bars, although European sellers have little reinforcing steel to offer for delivery under four months.

Higher domestic prices this summer have contributed to renewed activity in imported steel.

Activity in imported reinforcing steel is still centered principally in the South. This is true in nails and barbed wire also. Higher domestic prices on these latter items have enabled importers at Gulf ports to quote as far inland as northern Mississippi and parts of Tennessee.

European producers of oil country pipe are active in the South and are equalizing prices with Pittsburgh, plus barge freight to New Orleans and Houston.

Steel Import Prices

(Base per 100 lb, landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$6.10	$6.10	$6.10	$6.50
Bar Size Angles	6.00	6.00	6.00	6.40
Structural Angles	5.80*	5.80*	5.80*	6.20*
I-Beams	5.80*	5.80*	5.80*	6.20*
Wide Flange Beams	5.95*	5.95*	5.95*	6.35*
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	28.43	28.43	28.43	30.26
Barbed Wire (†)	5.95	5.95	5.95	6.28
Merchant Bars	6.00*	6.00*	6.00*	6.40*
Hot-Rolled Bands	6.00*	6.00*	6.00*	6.28*
Wire Rods, Thomas Commercial No. 5	5.85	5.85	5.85	6.25
Wire Rods, O-H Cold Heading Quality No. 5	5.85*	5.85*	5.85*	6.13*
Bright Common Wire Nails	7.65	7.65	7.65	8.05

Oil Country Pipe: Prices on all sizes equalized with Pittsburgh plus barge freight to New Orleans and Houston.

*Nominal. †Per 82-lb. net. reel. ‡Per 100-lb kegs, 20d nails and heavier.

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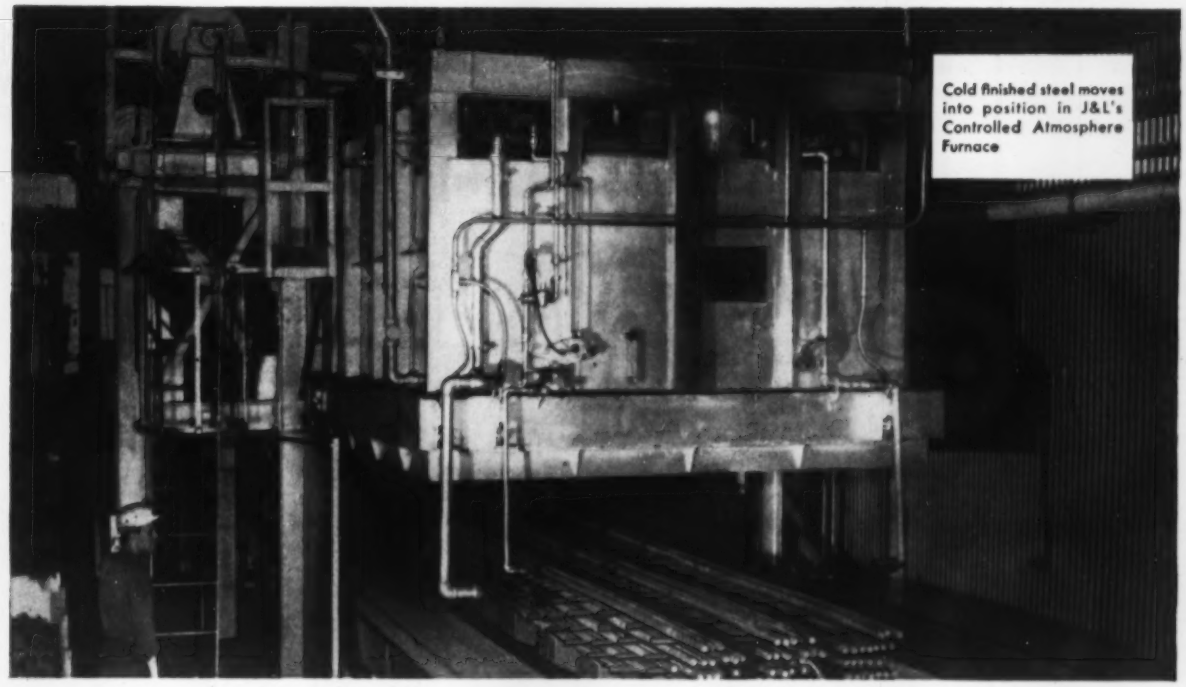

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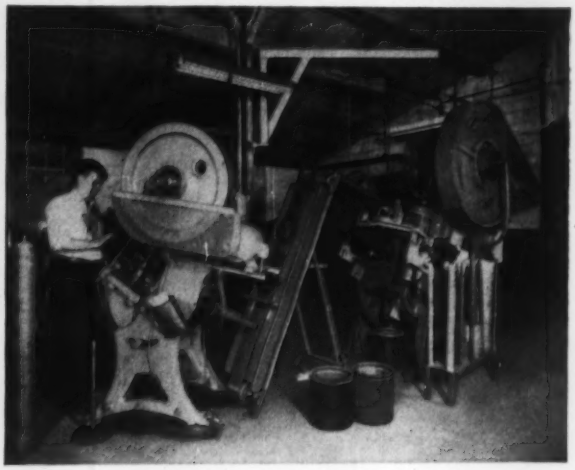

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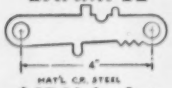

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 30.00c per lb contained Cr. 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carloads, packed 8 M x D, 18.35c per lb of alloy, ton lot 19.2c; less ton lot, 20.4c, delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 23.50c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.4c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10% carbon grades, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11c per lb of contained Si, carload packed 12.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet. Packed c.l. 7.15c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67, delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.80-$6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min. C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, deld.; less ton lots $4.70.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5.7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal, Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn. $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa. $1.24.

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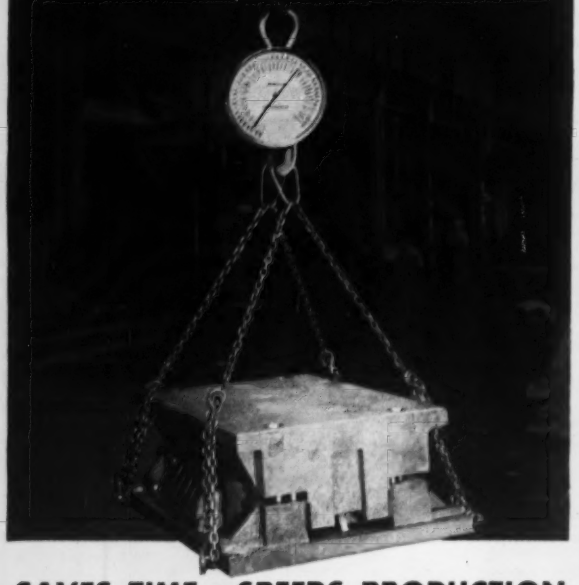

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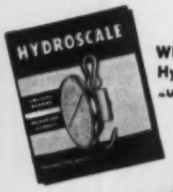

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Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer $10.40
Old range nonbessemer 10.25
Mesabi bessemer 10.25
Mesabi nonbessemer 10.10
Open-hearth lump 11.25
High phosphorus 10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68% 20.00
N. African hemanite (spot)...nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)..24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality $33.50
Domestic, scheelite, mine 63.00

Manganese Ore

Mn 48%, nearby, 95c-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1 .....nom. $45.00-$50.00
48% 3:1 ..... 42.00-44.00
48% no ratio 34.00

South African Transvaal

44% no ratio .....$19.00-$20.00
48% no ratio 32.00

Domestic

Rail nearest seller

18% 3:1 ..... $39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60% .....$3.50-$3.75
60-65% 3.75-3.90

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic $1.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: St. Louis, $150.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawston, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawston, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $125; Woodbridge, N. J., $122.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $194; Danville, Ill., $197.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $241; Danville, Ill., $244.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., $288.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $286.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Blitmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Nario, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ¼-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅜-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace .....$13.25-$14.00
Connellsville, foundry 16.00-17.00

Oven Foundry Coke

Kearney, N. J., ovens $25.50
Camden, N. J., ovens 25.00
Everett, Mass., ovens
New England, deld. *27.06
Chicago, ovens 25.75
Chicago, deld. 27.25
Terre Haute, Ind., ovens 25.50
Milwaukee, ovens 26.25
Indianapolis, ovens 25.50
Cincinnati, deld. 27.10
Painesville, O., ovens 26.25
Cleveland, deld. 28.18
Erie, Pa., ovens 25.00
Birmingham, ovens 22.65
Cincinnati, deld. 27.58
Buffalo, ovens 25.75
Buffalo, deld. 27.00
Lone Star, Tex., ovens 19.50
Neville Island, Pa., ovens *25.00*
Philadelphia, ovens 25.00
Swedeland, Pa., ovens 25.00
St. Louis, ovens
St. Louis, deld. 26.00
St. Paul, ovens 25.00
Detroit, ovens 26.25
Detroit, deld. 27.25
Pontiac, deld. 27.81
Saginaw, deld. 29.33

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol 36.00
Toluol, one deg. 32.00-35.00
Industrial xylol 32.00-35.00

Per ton, bulk, ovens

Ammonium sulphate .....$42-$45
Birmingham area .....42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol: Grade 1, 14.00; Grade 2-3, 13.50; Grade 4, 15.50; Grade 5, 14.25

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, duty paid, metallurgical grade: European, $31-$33; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Inches		Per
Diam	Length	100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5⅛	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

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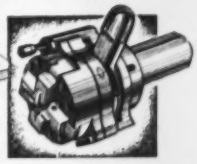

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Scrap . . .

Scrap Prices, Page 164

Chicago—A stronger tone in scrap has been developing but so far it hasn't resulted in consumers paying higher prices. Rather its evidence is in higher prices which industrial plants are being offered for material. The test is expected momentarily in mill purchases delayed from late August. Cast scrap is in slower demand because of strikes in certain industries like farm equipment, these either closing captive foundries or restricting requirements for gray iron and malleable castings.

It is a strong probability that trading in scrap steel futures, initiated a year ago by the Chicago Mercantile Exchange, has come to an end. Trading in October futures for No. 1 heavy melting, were closed out with two contracts sold on Aug. 25 and three on Aug. 26. Only 22 contracts of 160 tons were traded in the October contract. It is likely that trading for January will not be opened.

Trading in scrap steel futures was undertaken by the exchange on Sept. 7, 1954, with a January contract for No. 1 heavy melting. Trading aggregated 205 contracts of 40 tons each. This was followed by a March contract which was liquidated at end of February. Thereafter, conditions of trading were revised extensively.

Pittsburgh—A mill on the fringe of this district bought a small amount of No. 1 and No. 2 heavy melting scrap and No. 2 bundles last week. The purchase was made from dealers outside Pittsburgh. As the only major purchase it was considered typical of present stationary conditions in this area. No. 1 heavy melting sold for $44 and No. 2 heavy melting for $40 a ton. That represents a drop of $1 a ton from the last recorded mill purchase in August, but it is $1 above what brokers paid in the first week of September.

Most market observers believe this represents a lull in a rising market. Mill operations in fourth quarter should be stronger than in third quarter, they point out. Cast iron grades and turnings and borings continue to move quickly, increasing in demand.

New York—Scrap brokers' buying prices are unchanged but strong. Export demand continues good and some sizable tonnages for domestic consumers are under negotiation, which may result in higher prices shortly.

Philadelphia — Strength prevails throughout the entire list of scrap prices here, and especially in the cast grades. No. 1 cupola cast and malleable are scarce in some adjacent areas with consumers there drawing on material here and causing local buyers to step up their prices to get tonnage. No. 1 cupola is now holding at the advanced range of $38.50-$39.50 delivered, and malleable at $51-$52. Heavy breakable cast also is higher at $45-$46.

Boston—Except for No. 2 heavy melting steel and bundles, both off 50 cents to $1 per ton, scrap prices are unchanged.

Cleveland—Substantial buying by Valley steel mills is providing new support to the scrap market. While prices are unchanged on the steelmaking grades both here and in the Valley, expectations are further buying will push the market higher.

Cincinnati—Prices have eased in this market. Limited purchases by the local mill have pushed quotations down $1 to $2.

Birmingham—The scrap market continues listless except for electric furnace grades.

Los Angeles—The scrap market remains firm, with prices unchanged and mills buying steadily.

San Francisco—Steel scrap prices have advanced $2 a ton, succumbing to the pressure of exports and steady mill demand.

Seattle—The scrap market is active. Export influences are adding

(*Please turn to page* 166)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 7	$44.00
Aug. 31	43.83
Aug. Avg.	43.97
Sept. 1954	29.94
Sept. 1950	40.93

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*35.00-36.00*
No. 1 busheling	*43.00-44.00*
Machine shop turnings	*28.00-29.00*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*32.00-33.00*
Cast iron borings	*32.00-33.00*
Cut structurals, 3 ft lengths	48.00-49.00
Heavy turnings	42.00-43.00
Punchings & plate scrap	48.00-49.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Charging box cast	37.00-38.00
Heavy breakable cast	37.00-38.00
Unstripped motor blocks	29.00-30.00
No. 1 machinery cast	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	51.00-52.00
Railroad specialties	52.00-53.00

Stainless Steel Scrap

18-8 bundles & solids	265.00-275.00
18-8 turnings	120.00-130.00
430 bundles & solids	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting	43.50-44.50
No. 2 heavy melting	32.00-33.00
No. 1 bundles	43.50-44.50
No. 2 bundles	29.00-30.00
No. 1 busheling	43.50-44.50
Machine shop turnings	23.00-24.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	27.00-28.00
Cast iron borings	27.00-28.00
Low phos.	45.00-46.00
Cut structural plates 2 ft and under	*47.00-48.00*
Alloy free, short shovel turnings	31.00-32.00
Electric furnace bundles	43.50-44.50

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	40.00-41.00
Stove plate	46.00-47.00
Heavy breakable cast	37.00-38.00
Unstripped motor blocks	29.00-30.00
Brake shoes	35.00-36.00
Clean auto cast	48.00-49.00
Burnt cast	37.00-38.00
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R.R. malleable	51.00-52.00
Rails, 2 ft and under	*56.00-57.00*
Rails, 18 in. and under	*57.00-58.00*
Rails, random lengths	*50.00-51.00*
Cast steel	46.00-47.00
Railroad specialties	52.00-53.00
Uncut tires	47.00-48.00
Angles, splice bars	53.50-54.50
Rails, rerolling	60.00-61.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	275.00-280.00
18-8 turnings	130.00-140.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	35.00-36.00
No. 1 bundles	46.00-47.00
No. 2 bundles	32.00-33.00
No. 1 busheling	46.00-47.00
Machine shop turnings	24.00-25.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	46.00-47.00
Electric furnace bundles	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00

CHICAGO

No. 1 heavy melting	41.00-43.00
No. 2 heavy melting	*34.00-35.00*
No. 1 factory bundles	43.00-44.00
No. 1 dealer bundles	40.00-41.00
No. 2 bundles	31.00-32.00
No. 1 busheling	41.00-43.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	29.00-30.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Cut structurals, 3 ft	45.00-46.00
Punchings & plate scrap	46.00-47.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	36.00-37.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	50.00-51.00
Drop broken machinery	50.00-51.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R.R. malleable	51.00-52.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Angles, splice bars	53.00-54.00
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles & solids	265.00-275.00
18-8 turnings	140.00-150.00
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	39.00
No. 2 heavy melting	29.00
No. 1 bundles	39.00
No. 2 bundles	27.00
No. 1 busheling	39.00
Machine shop turnings	21.00
Mixed borings, turnings	21.00
Short shovel turnings	23.00
Punchings & plate scrap	44.00

Cast Iron Grades

Charging box cast	32.00
No. 1 cupola	39.00
Stove plate	32.00
Heavy breakable	32.00
Unstripped motor blocks	22.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	32.00-33.00
No. 2 bundles	24.00-25.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings	25.00-26.00
Machine shop turnings	21.00-22.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	46.00-47.00
Stove plate	43.00-44.00
Bar crops and plate	40.00-41.00
Structural plate, 2 ft	39.00-40.00
Unstripped motor blocks	35.00-36.00
Charging box cast	27.00-28.00
No. 1 wheels	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 2 ft and under	44.00-45.00
Rails, 18 in. and under	*51.00-52.00*
Rails, rerolling	53.00-54.00
Rails, random lengths	*47.00-48.00*
Angles, splice bars	*48.00-49.00*

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	46.00-47.00
No. 2 bundles	*37.00-39.00*
No. 1 busheling	46.00-47.00
Electric furnace bundles	47.50
Machine shop turnings	28.00-28.50
Mixed borings, turnings	27.00-28.00
Short shovel turnings	30.50-31.00
Structurals & plate	*49.00*
Heavy turnings	42.00
Couplers, springs, wheels	50.00
Rail crops, 2 ft & under	54.00

Cast Iron Grades

No. 1 cupola	*38.50-39.50*
Malleable	*51.00-52.00*
Heavy breakable cast	*45.00-46.00*
Drop broken machinery	47.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	40.50-41.50
No. 2 heavy melting	37.00-38.00
No. 1 bundles	40.50-41.50
No. 2 bundles	31.00-32.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	22.00-23.00
Low phos. (structural & plate)	42.00

Cast Iron Grades

No. 1 cupola	33.00-34.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	37.00-38.00

Stainless Steel

18-8 sheets, clips, solids	270.00-275.00
18-8 borings, turnings	135.00-140.00
430 sheets, clips, solids	115.00-120.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	35.50-36.50
No. 2 bundles	*25.00-26.00*
Machine shop turnings	18.50-19.00
Mixed borings, turnings	21.50-22.00
Short shovel turnings	22.50-23.00
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	36.00-37.00
No. 1 bundles	39.00-40.00
No. 2 bundles	33.00-34.00
No. 1 busheling	39.00-40.00
Mixed borings, turnings	29.00-30.00
Machine shop turnings	27.00-28.00
Short shovel turnings	30.00-31.00
Cast iron borings	30.00-31.00
Low phos.	45.00-46.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	47.00-48.00
Rails, 2 ft and under	51.00-52.00
Railroad specialties	48.00-49.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*39.50-40.50*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*39.50-40.50*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*39.50-40.50*
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	*23.00-24.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*23.00-24.50*
Low phos., 18 in.	45.00-46.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	38.00-39.00
Charging box cast	38.00-39.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00
Rails, 18 in. and under	*55.00-56.00*
Rails, random lengths	*48.00-49.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	36.50
No. 2 heavy melting	34.00
No. 1 bundles	36.50
No. 2 bundles	29.50
Machine shop trnings.	26.00
Short shovel turnings	27.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	36.00
Heavy breakable cast	36.00
Unstripped motor blocks	35.00
Brake shoes	36.00
Clean auto cast	46.00
Stove plate	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00
Rails, 18 in. and under	53.00
Rails, random lengths	48.00
Rails, rerolling	62.00
Angles, splice bars	50.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	35.00
No. 2 heavy melting	31.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	42.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	35.00
Heavy breakable cast	30.00
Unstripped motor blocks	29.00
No. 1 wheels	35.00
Stove plate (f.o.b. plant)	25.00
Brake shoes	28.00-29.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths	33.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	25.00
Machine shop turnings	10.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	43.00-45.00

SAN FRANCISCO

No. 1 heavy melting	*34.00*
No. 2 heavy melting	*32.00*
No. 1 bundles	*34.00*
No. 2 bundles	*29.00*
No. 1 busheling	*34.00*
Machine shop turnings	*14.00*
Mixed borings, turnings	*14.00*
Short shovel turnings	*16.00*
Cast iron borings	*16.00*
Cut structurals	*36.00*
Heavy turnings	*14.00*
Punchings & plate scrap	*34.00*

Cast Iron Grades

No. 1 cupola	*42.00*
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

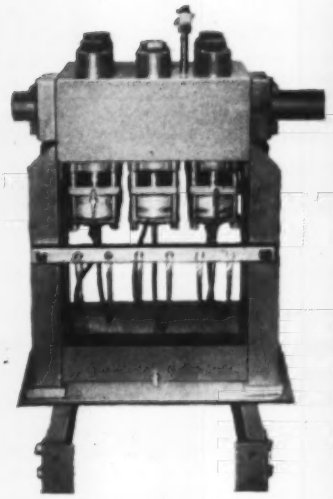
(Delivered prices)

No. 1 heavy melting	38.50
No. 2 heavy melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Mixed borings, turnings	17.00
Rails, remelting	47.50
Busheling, new factory: Prepared	36.50
Unprepared	32.50
Short steel turnings	21.00

Cast Iron Grades†

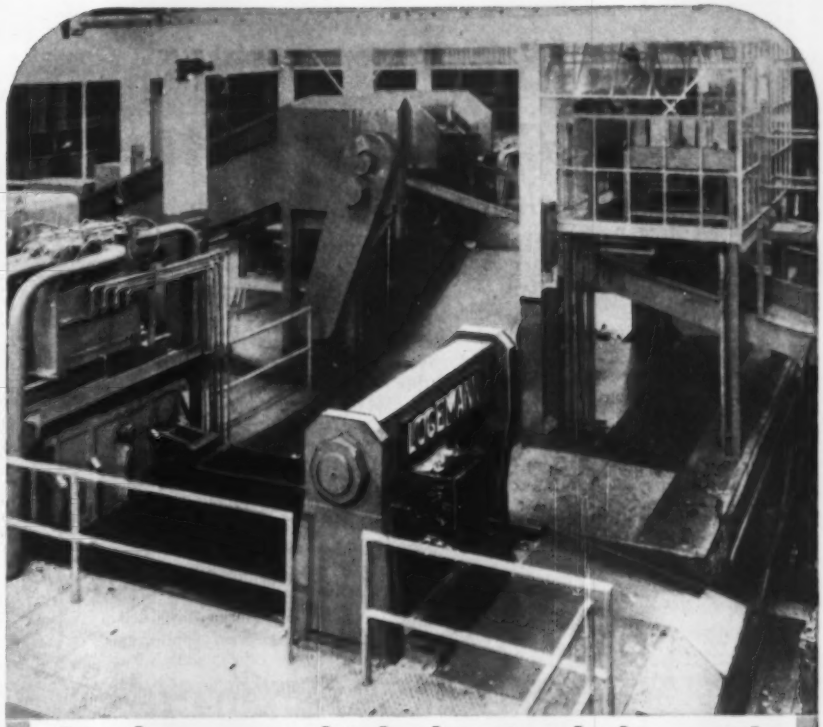
No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



LOGEMANN HYDRAULIC OPERATING VALVE

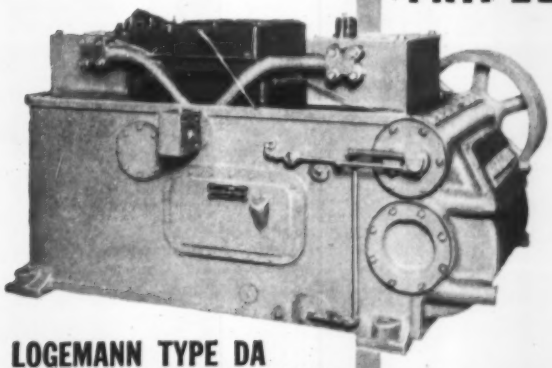
This compact valve was designed to control the movements of the hydraulic rams in large scrap presses but can be modified to suit similar operations on other hydraulic equipment. Interested parties will please outline the nature of the service, operating sequence, gallonage and pressure requirements.



Get low cost, high density bales with LOGEMANN SELF-CONTAINED TRIPLE-COMPRESSION PRESSES

The illustration shows one of two large scrap-press units in a modern automotive plant. Over a period of many years, such units have baled sheet scrap skeletons and trim from metal operations in large industrial plants throughout the country, forming the scrap into high-density bales for re-melting in steel mills. Low baling costs are the result of correct design for heavy duty service, minimum maintenance and operating interruptions, as well as simplicity, accessibility and safety features.

Pioneers in the metal baling field, LOGEMANN engineers embodied in the design those features that have proven dependable over an extended period of years. Some installations in service over 35 years are still operating economically.



LOGEMANN TYPE DA DOUBLE PRESSURE PUMPS

These compact and efficient opposed-cylinder reciprocating-plunger pumps for low and high pressure service lend themselves to a wide range of double pressure applications. They are close-coupled, reliable, and capable of delivering high gallonage, at low and high pressures, at low power costs.

Tell Us the nature of your scrap!

LOGEMANN press sizes are not confined to the large models. Producers of sheet scrap—steel, copper, brass, or aluminum—are invited to submit their scrap baling problems regardless of tonnage. Please state the character of the metal, minimum tonnage to be handled in a given period of hours, range of gauges and, where possible, indicate maximum and minimum lengths and widths of pieces. Experienced sales engineers are available for discussion of your conditions and requirements.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

SAVE $155 PER TON with *MicroRold*® Stainless Steel

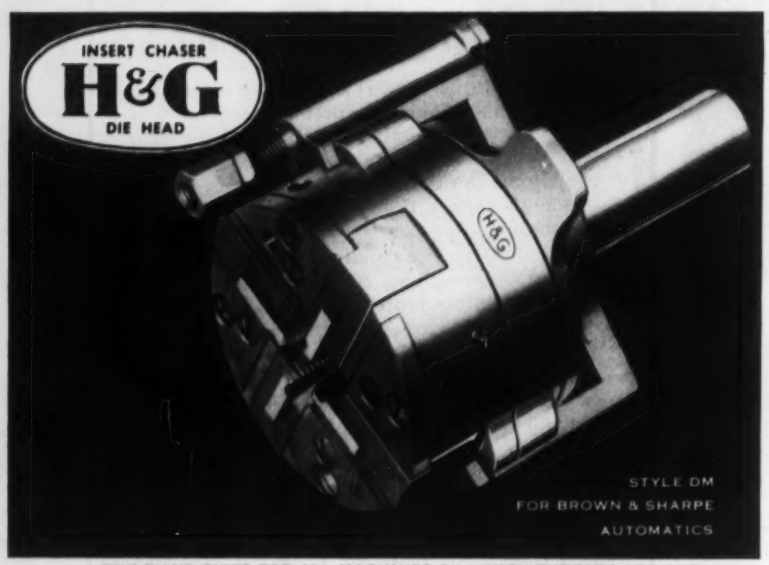
7¾c Per Lb. Price Differential Between Types 430 and 302 Results In This Substantial Savings

By specifying MicroRold Type 430 stainless steel for suitable applications, stainless steel buyers can take advantage of the 7¾c per pound difference in price between Type 430 and Type 302 stainless. A saving of $155 per ton merits consideration. Type 430 is a straight chromium-stainless with a nominal composition of 17% Chromium. During the Korean conflict, Type 430 was used extensively, due to government restriction on nickel-bearing stainless.

WIDE USE FOR TYPE 430

While Type 430 does not possess the same degree of corrosion resistance as Type 302, it has proven very satisfactory in a wide range of mild corrosion applications, both interior and exterior. It lends itself to a multitude of decorative and functional uses combining all the advantages and qualities of stainless steel—beauty, strength, corrosion resistance, long life, workability and ease of maintenance. Considering the price advantage, with no sacrifice in quality when applied properly, stainless steel buyers will find MicroRold Type 430 a worthwhile material for an impressive number of stainless steel applications.

Washington Steel
Corporation
WASHINGTON PENNSYLVANIA



STYLE AND SIZES FOR ALL MACHINES ON WHICH THREADS ARE CUT

On Brown and Sharpe, and other automatics

INSERT CHASERS SAVE UP TO 33%

Insert chasers are like safety razor blades: they cost so little that you can throw them away when dull. Or, for utmost economy, you can resharpen them over and over again. Only a flash grind is required. For less than $40 you get a dozen sets of ¾—16 insert chasers, each set ground ready to go. You will be amazed at the quantity of threads they will cut, even to Class 3 specifications, with a minimum of downtime. FREE: "Unified and American Screw Thread Bulletin".

THE EASTERN MACHINE SCREW CORPORATION 22-42 Barclay St., New Haven, Conn.

LINES WANTED—OHIO

Experienced Sales Representative desires one or two more lines for Cleveland and North Eastern Ohio. Now selling Fasteners and Wooden Shipping Cases to OEM and wholesale Hardware Distributors. Excellent contacts.

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Penton Building Cleveland 13, Ohio

CLASSIFIED

Positions Wanted

PURCHASER OF TOOLS
Graduate Engineer. Apprenticeship in Tool & Die Making and Design. Can save you money and get your tooling on time. Twenty years tool procurement experience. Age 47. Reply 299, STEEL, Penton Building, Cleveland 13, Ohio.

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WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—
Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry.
When you have an opportunity to offer, use the Help Wanted columns of STEEL.

(*Concluded from page* 163)

strength. The new levels of $35 and $31 for No. 1 and No. 2 heavy melting, respectively, have stimulated country shipments.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1600 tons, power plant extension, Western Massachusetts Electric Co., West Springfield, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Stone & Webster Engineering Corp., Boston.

1400 tons, building extension, Smith, Kline & French, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, maintenance hangar and facilities, naval air station, Oceana, Va., to Globe Iron Construction Co., Norfolk, Va.; Blythe Building Co. Inc., Charlotte, N. C., general contractor.

300 tons, joint junior and senior high school, Boyerstown, Pa., to Robinson Steel Co., Philadelphia.

645 tons, Fox Point interchange bridges, Providence, R. I., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through M. A. Gammino Construction Co., Providence, general contractor.

160 tons, Washington state bridge, Wahkiakum county, to unstated fabricator; general contract to Lockyear & White, Longview, Wash.

STRUCTURAL STEEL PENDING

5000 tons, Senate Office Building, Washington, D. C.; George Hyman Construction Co., Washington, low on general contract.

3000 tons, Morrison street bridge approaches, Portland, Oreg.; bids soon to Multnomah county commissioners.

2065 tons, bridges, Hammond, Ind., Indiana Toll Road Commission; bids Sept. 15, Indianapolis; also 10,000 linear feet, steel piling.

2000 tons, span steel, Morrison street bridge, Portland, Oreg.; bids soon to Multnomah county commissioners.

1250 tons, state bridge work, Berks county, Pa., bids Sept. 30.

1000 tons, state bridge work, Scranton, Pa.; Latrobe Construction Co., Latrobe, Pa., low on general contract.

250 tons, Pennsylvania railroad bridge, Washington, D. C.; bids closed Sept. 6.

235 tons, state bridge work, Northampton county, Pa.; bids Sept. 30.

Railroad Diesel Equipment

excellent operating condition

FOR SALE OR RENT

- Five Cooper-Bessemer **125-TON DIESEL ELECTRIC SWITCHING LOCOMOTIVES,** purchased new 1938-1940; equipped with Twin 500 H.P. engines, center cab, all completely overhauled 1953-1954.
- One American Hoist and Derrick **50-TON DIESEL LOCOMOTIVE CRANE,** 65-foot boom, with generator for magnet, new in 1947. Completely overhauled 1954.
- One Industrial Brownhoist **40-TON DIESEL MECHANICAL CRANE,** 55-foot boom, with generator for magnet. Purchased new 1940. Completely overhauled 1955.
- One Industrial Brownhoist **100-TON DIESEL RAILROAD WRECKING CRANE,** completely overhauled and reconditioned.
- **FREIGHT CARS — ALL TYPES BOUGHT, REPAIRED, LEASED OR SOLD — FOR INTER-PLANT OR MAINLINE SERVICE.**
- **SERVICE TESTED FREIGHT CAR PARTS.**
- Tank car tanks for storage.

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SALES ENGINEER

Opening in Sales-Engineering Department with opportunity for advancement in a long-established manufacturing firm.

Must have a good engineering background. Experience and familiarity with Cold Roll Forming, Bending, Straightening and Slitting machinery desirable.

Write and furnish full information regarding education, training, details of experience, age, salary expected, etc.

A permanent position for the right person. All replies will be considered strictly confidential.

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MECHANICAL ENGINEER

Permanent position for BSME project engineer with international engineering and construction firm located on West Coast. Require approximately 15 years engineering experience in project coordination for the design and construction of steel or nonferrous plants and mills. Heavier experience in steel mills, including blooming, rolling, hot strip and tin mills is desirable. Engineering experience in blast and open hearth furnaces also desirable. Write, giving resume and salary requirement to:

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Penton Building Cleveland 13, Ohio

INDUSTRIAL SITE
Brooklyn, New York

R. R. Siding, Unrestricted Area, Corner Vacant Lot 92,000 Square Feet. One Block from Subways. Excellent Labor Market near Tunnels and Bridges.

Asking $2.25 per Square Foot.

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Unusual opportunity for qualified person. We offer the job of Manager of Sales to direct and take complete charge of our Strip Steel Sales Department. Our warehouse is fully equipped to handle steel and aluminum coils in all gauges and widths. We have the latest and finest automatic slitting and decoiling equipment with a tremendous potential in sales volume. We offer a minimum starting salary of 5 figures plus commission and expenses. Unless you are a leader, have had warehouse experience in selling steel in strip and coils and can take the responsibility of Sales Manager of our Strip Department, you need not answer this ad. All replies will be held in strictest confidence. Call Mr. Cary, Century Steel Corporation, Yards 7-4949, 630 W. 41st Street, Chicago, Illinois.

FOR SALE

1—7½ ton P & H double girder combination floor & cage travel-lift crane 65 ft. span max. lift 27 ft. standard motor driven full magnetic 5 step variable speed. Power 440 volts A.C. 3 phase 60 cycle girder spread 7 ft. New, never used.

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MANUFACTURER OF METAL PRODUCTS WANTED

Large producer of basic metals desires to acquire through exchange of securities, a manufacturer of metal products. Will consider steel fabricators or companies producing forgings, heavy steel containers, sheet steel products, stampings, hardware, seamless tubing, transportation, agricultural or earth-moving equipment, products of special steels or non-ferrous metals and aluminum extrusions or sheets. Will also consider a manufacturer of several types of plastic pipe with research facilities.

In reply, give full description of products and operations.

Reply Box 301, STEEL
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An Alcoa Aluminum Fastener should be used here !

It's an aluminum chair assembly, worth the lasting strength of Alcoa® Aluminum Fasteners. You avoid galvanic and atmospheric corrosion. You get perfect color match; you get the very highest quality product. Your local Alcoa distributor has a complete stock.

P. S. For this chair assembly, we suggest an aluminum machine screw, washer and nut from Alcoa's complete line of aluminum fasteners.

Aluminum Company of America
2250-J Alcoa Building, Pittsburgh 19, Pa.
Gentlemen:
Please send complete specification data and samples of your aluminum fasteners.

name _____
title _____
company _____
address _____

Always Fasten Aluminum with Alcoa Aluminum Fasteners

100 tons, plus, including 62 tons of switchyard structurals and miscellaneous, Palisades, Idaho, power project; b'ds to Bureau of Reclamation, Palisades, Oct. 13.

100 tons, plus, buildings and additional facilities, national reactor station, Arco, Idaho; general contract to Bickford Construction Co., Portland, Oreg.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1260 tons, bu'lding, State Mutual Assurance L'fe Co., Worcester, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., Boston, general contractor.

1009 tons, housing project, Lowell, Mass., to Northern Steel Inc., Medford, Mass., superstructure, and Truscon Steel Division, Republic Steel Corp., Boston, foundation; M. Spinelli & Son Inc., Boston, general contractor.

125 tons, school, Ipswich, Mass., to Concrete Steel Co., Boston; Charles Logue Building Co., Boston, general contractor.

105 tons, maintenance hangar and facilities, naval air station, Oceana, Va., to Virginia Steel Co., Richmond; Blythe Building Co. Inc., Charlotte, N. C., general contractor.

100 tons, or more, power and miscellaneous buildings, Western Electric Co., Topsham, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Gilbane Building Co., Providence, R. I., general contractor.

50 tons, First Hill clinic building, Seattle, to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

1250 tons, grade crossing elimination, Boston & Maine railroad, Salem, Mass.; Farina Bros. Inc., Newton, Mass., low, general contract; state project.

980 tons, also 1450 feet of steel piling, state furnished, unit extension of waterfront viaduct, Seattle; bids to Olympia, Wash., Oct. 4.

920 tons, drainage and bridge structures, Indiana toll road, Hammond, Ind.; bids Sept. 14, Indianapolis.

485 tons, concrete deck, Sakonnet river, Portsmouth-Tiverton, R. I.; General Engineering & Contracting Co., Providence, R. I., general contractor.

269 tons, also shapes, Washington state, Benton county, undercrossing; bids to Olympia, Wash., Sept. 20.

137 tons, Washington state road projects; Grays Harbor county to Manson Construction & Engineering Co., Seattle.

115 tons, Washington state road projects; Yakima and Benton counties; bids to Olympia, Wash., Sept. 20.

PLATES . . .

PLATES PLACED

100 tons, elevated water tank, Ocala, Fla., to Chicago Bridge & Iron Co., Chicago.

PIPE . . .

CAST IRON PIPE PENDING

250 tons, 12 and 8-in., also alternatives; bids to Skagit county, P.U.D., Mt. Vernon, Wash., Sept. 14.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian National, three 400-hp road switching diesel-electric units to the Canadian General Electric Co.

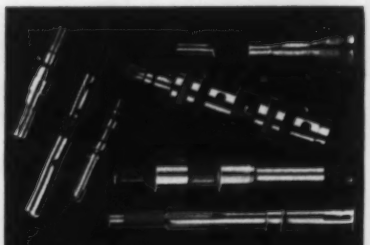
Southern Pacific, 185 diesel engines to the Electro-Motive Division, General Motors Corp., La Grange, Ill., Alco Products Inc., New York, and Fairbanks-Morse & Co., Chicago.

Spokane, Portland & Seattle, 15 diesel-electric road switching units, with nine of 1600-hp going to Alco Products Inc., New York, and six of 1750-hp to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Boston & Maine, 1000 fifty-ton roller bearing box cars, to the Pullman-Standard Car Mfg. Co., Chicago.

Pennsylvania, one-hundred 175-ft flat cars, 70-ton capacity, and equipped with roller bearing trucks, to its Altoona, Pa. shops.



Your machining department for hardened and precision ground screw machine products. Send for brochure & equipment list.

Ottawa STEEL PRODUCTS INC.
Grand Haven Michigan

EUREKA FIRE BRICK WORKS
Works: Mt. Braddock, Fayette Co., Pa.
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COVERED HOT TOP BRICK
INGOT MOLD PLUGS

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PITTSBURGH 6, PA. EM: 2-0614

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AIR-CONDITIONED
Guest Rooms

NOW you can be *sure* of an air-conditioned room when you come to Baltimore! Teletype: BA 263.

The Lord Baltimore HOTEL

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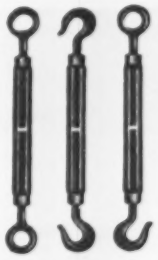
UPSON-WALTON

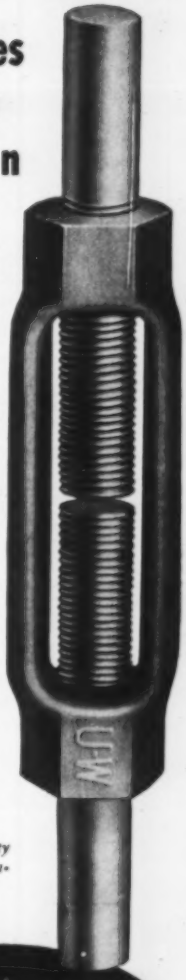
turnbuckles you can depend on

Weldless, hex-end bodies are drop forged from special bar quality forging steel.

Heads are drilled and tapped in perfect alignment, so that end fittings pull evenly.

Threading is American National Course series, class 2 fit, for easy assembly.





In the long run quality costs less. Specify Upson-Walton turnbuckles.

ENGINEERED FOR SAFETY

For prompt service call your U-W Distributor. Write for free catalog on wire rope fittings.

THE UPSON-WALTON COMPANY

12500 ELMWOOD AVENUE

CLEVELAND 11, OHIO

New York • Chicago • Pittsburgh

MANUFACTURERS OF TACKLE BLOCKS, WIRE ROPE, ROPE FITTINGS • ESTABLISHED 1871

Delivery when promised . . . dependability in every piece . . . and economically produced in stainless steel

on Carlson Order No. 17656

Not every shipment is as diversified as GOC 17656 but it illustrates the typical all-around service in stainless steel available from G. O. Carlson, Inc.

There are plates, heads, rings, circles, flanges, bars and rounds—all stainless steel to chemical industry standards—all made to match the specifications on the customer's blueprint. It took special equipment to make up this order—equipment designed and built by Carlson engineers who work *exclusively* in stainless.

This equipment in the hands of Carlson specialists *lowers* costs. You pay no freight on material you can't use and you save man-hours in easier fit-up, because the material is ready for fabrication when you get it.

When you order your stainless steel from G. O. Carlson, Inc. you can be sure of three things: (1) it is economically produced from the highest quality material; (2) it is cut to your specifications; (3) it is shipped on time. Write *right now* for complete information.

Stainless Steels Exclusively

G. O. CARLSON, INC.

THORNDALE, PENNSYLVANIA

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

District Sales Offices in Principal Cities

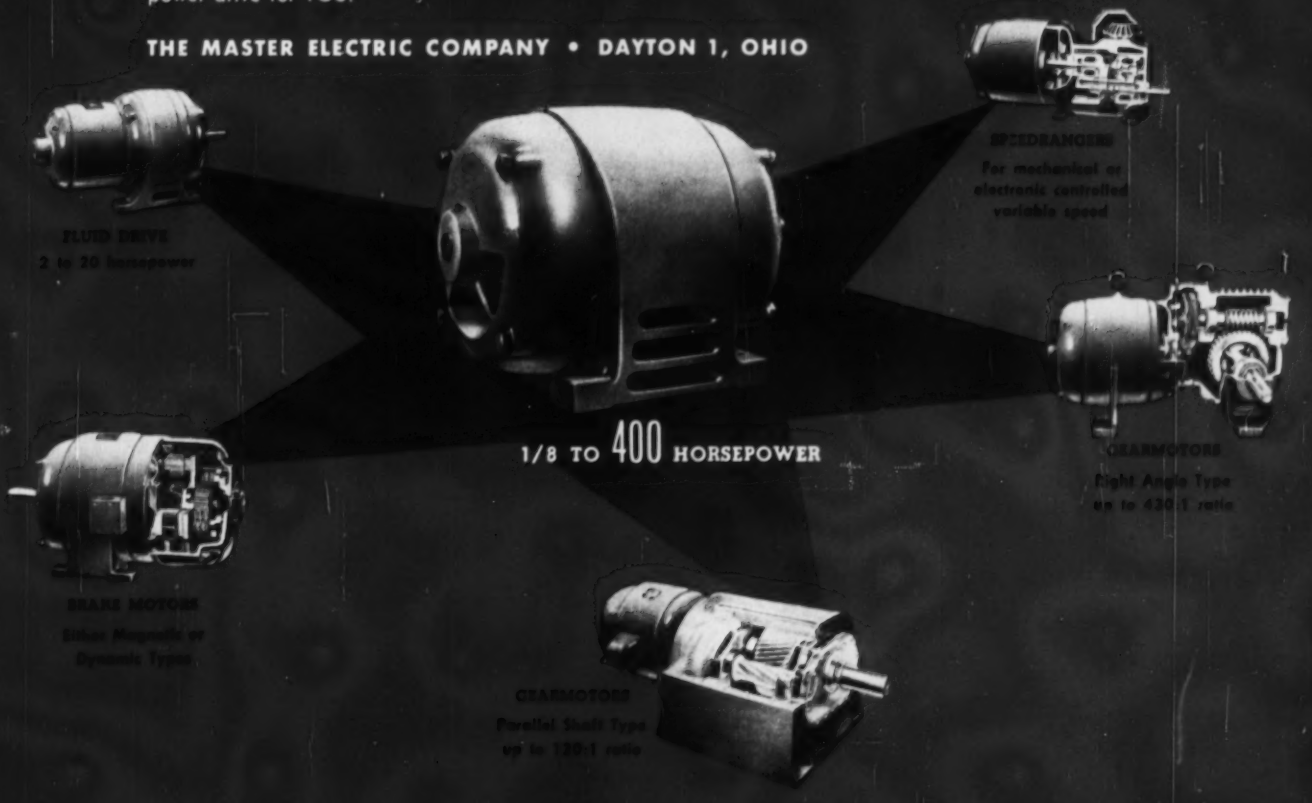
Whenever you select a power unit, don't put a straight-jacket on your ideas . . . consider ALL of the possibilities of modern power drives.

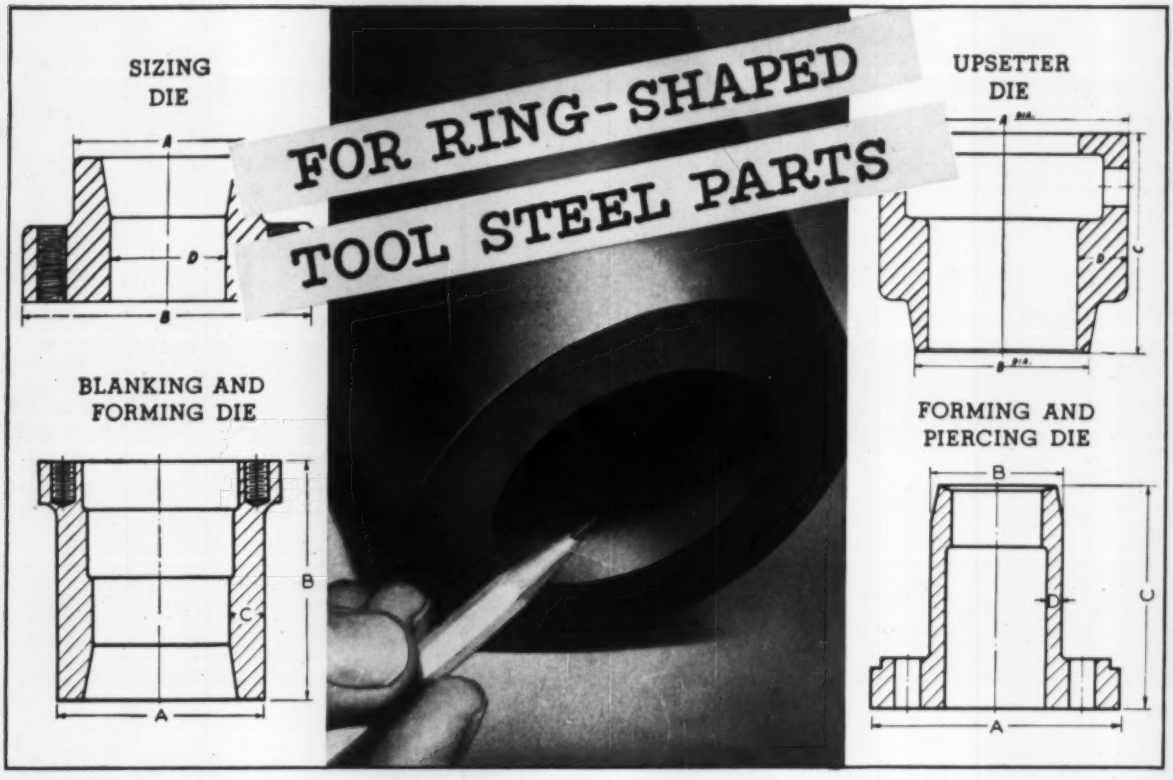
For example consider the many useful combinations that can be secured with the basic Master power units shown below. They're designed so they can be easily combined together to give you the RIGHT horsepower, the RIGHT shaft speed, the RIGHT features in one compact unit that you can use RIGHT where you want it. Nowhere else will you find power units that are so flexible, so easily adaptable, and in such a wide range of types and ratings.

Master power drives are available in thousands and thousands of ratings (1/8 to 400 HP) . . . in open, enclosed, splash proof, fan cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 430 to 1 ratio . . . with electric brakes . . . with fluid-drive . . . with mechanical or electronic variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best power drive for YOU.

give your brains a chance

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO





New Graph-Mo Hollow-Bar eliminates drilling, machines 30% faster

MAKERS of ring-shaped tool steel parts who use Graph-Mo Hollow-Bar will tell you it speeds up production, cuts down waste, and saves steel. That's because the hole is already in it. There's no drilling, you start with finish boring.

What's more, you get all the proved advantages of Graph-Mo that have made it one of the most popular tool steels—excellent machinability, wearability, and stability.

Graph-Mo machines 30% faster than other tool steels and has a minimum tendency to scuff or gall. The combination of free-graphite and diamond-hard carbides in its structure gives it exceptional wearability. Users report that Graph-Mo outwears other tool steels on an average of 3 to 1.

Graph-Mo also is the most stable tool steel ever made. For instance, a Graph-Mo steel master plug gage showed less than 10 millionths of an inch in dimensional change after 12 years of use. And Graph-Mo responds uniformly to heat treatment, too.

If you make ring-shaped tool steel parts, make sure you get all the advantages of Graph-Mo Hollow-Bar. Sizes range up to 16" O.D. with a variety of wall thicknesses. It's made by the specialists in fine alloy steels, The Timken Company.

Graph-Mo Hollow-Bar is distributed through A. Milne and Co. and the Peninsular Steel Co. warehouses.

To find out more about this tool steel, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING